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**Working Paper**

## The costs of job displacement over the business cycle and its sources: Evidence from Germany

IAB-Discussion Paper, No. 20/2022

**Provided in Cooperation with:**

Institute for Employment Research (IAB)

*Suggested Citation:* Schmieder, Johannes; von Wachter, Till; Heining, Jörg (2022) : The costs of job displacement over the business cycle and its sources: Evidence from Germany, IAB-Discussion Paper, No. 20/2022, Institut für Arbeitsmarkt- und Berufsforschung (IAB), Nürnberg, <https://doi.org/10.48720/IAB.DP.2220>

This Version is available at:

<https://hdl.handle.net/10419/265675>

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# IAB-DISCUSSION PAPER

Articles on labour market issues

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## 20|2022 Online Appendix - The Costs of Job Displacement over the Business Cycle and Its Sources: Evidence from Germany

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ISSN 2195-2663

# Online Appendix - The Costs of Job Displacement over the Business Cycle and Its Sources: Evidence from Germany

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Mit der Reihe „IAB-Discussion Paper“ will das Forschungsinstitut der Bundesagentur für Arbeit den Dialog mit der externen Wissenschaft intensivieren. Durch die rasche Verbreitung von Forschungsergebnissen über das Internet soll noch vor Drucklegung Kritik angeregt und Qualität gesichert werden.

The “IAB-Discussion Paper” is published by the research institute of the German Federal Employment Agency in order to intensify the dialogue with the scientific community. The prompt publication of the latest research results via the internet intends to stimulate criticism and to ensure research quality at an early stage before printing.

# 1 Mass Layoff Definition

In order to identify mass-layoffs and plant closings in the German administrative data we used the following approach. After merging the establishment history panel with information on all year to year cross establishment worker flows, we defined mass layoffs as a drop in employment from one year to the next of at least 30 percent in an establishment with at least 50 employees in the year before the employment drop. To assure that these establishments were relatively stable prior to the drop and that the drop did not constitute just temporary fluctuations, we also required that employment did not increase by more than 30 percent in either of the two years before the employment drop and did not re-bounce in the two years after the drop. Furthermore to avoid identifying restructuring of the firm (such as outsourcing of larger parts) as a mass-layoff, we required that not more than 20 percent of the leaving workers were re-employed together at a single establishment in the following year (thus the leaving workers are either unemployed or dispersed over many different establishments). Similarly we defined a plant-closing as a drop in employment of at least 80 percent, again requiring that not more than 20 percent of the leaving workers were re-employed together in the following year.

The establishment history panel and the flow data provide information on the workforce of the establishments on June 30th of each year. We thus consider a mass-layoff as happening in 1982 if a plant loses 30 percent of its workforce between 1981 and 1982. We consider a worker as displaced in 1982 if he permanently left an establishment in 1982 and this establishment had a mass-layoff either in 1982 or 1983.

A key step in measuring mass-layoff events is to distinguish between actual reductions in employment and events such as mergers, takeovers, outsourcing, or changes in employer identification numbers. Since such events occur frequently in administrative data, we have constructed a complete cross-flow matrix of worker flows between establishments. Using this flow matrix, we only consider a reduction in employment a mass-layoff event if no more than 20 percent of the laid-off workers are going to a single employer (i.e., if there is no large flow of workers to a different establishment). This is a common methodology used, say, by the U.S. Census to adjust longitudinal firm-level employment information. Not adjusting our mass-layoff data in this way would lead to measurement-error, likely biasing our results towards finding no effect of displacement on earnings.<sup>1</sup>

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<sup>1</sup> For an exploration of these cutoffs in the context of Germany see Hethey-Maier and Schmieder (2013).

## 2 A Note on Alternative Job Loss Specifications

Consider a group of workers who are displaced between year  $c - 1$  and  $c$  and a group of control workers. We call  $c - 1$  the “baseline year”. The sample of control workers is created in a way so that for each displaced worker cohort there is a group of workers who satisfies the same baseline restrictions as the displaced workers (e.g. 3 years of tenure, employer size  $\geq 50$ , age 25-50, ...). This control group could just be all workers that satisfy the baseline restrictions or a group of more narrowly matched workers (say on baseline earnings, tenure, ...). We call all workers who have the same baseline year (displaced or control) a “cohort” indexed by  $c$ .

$y_{itc}$  be earnings of individual  $i$  in year  $t$  belonging to cohort  $c$ .

### Specification 1 (JLS - Only Year Effects)

$$y_{itc} = \sum_{k=-5}^{15} \delta_k \times I(t = c + k) \times \text{Disp}_i + \pi_t + \alpha_i + X_{it}\beta + \varepsilon_{itc}$$

### Specification 2 (Only Relative Year Effects)

$$y_{itc} = \sum_{k=-5}^{15} \delta_k \times I(t = c + k) \times \text{Disp}_i + \sum_{k=-5}^{15} \gamma_k \times I(t = c + k) + \alpha_i + X_{it}\beta + \varepsilon_{itc}$$

### Specification 3 (Relative Year and Calendar Year Effects)

$$y_{itc} = \sum_{k=-5}^{15} \delta_k \times I(t = c + k) \times \text{Disp}_i + \sum_{k=-5}^{15} \gamma_k \times I(t = c + k) + \pi_t + \alpha_i + X_{it}\beta + \varepsilon_{itc}$$

## Specification 4 (Full Set of Cohort by Year Effects)

$$y_{itc} = \sum_{k=-5}^{15} \delta_k \times I(t = c + k) \times \text{Disp}_i + \sum_{\tilde{c}=1975}^{2009} \sum_{\tilde{t}=1980}^{2009} \pi_{tc} \times I(t = \tilde{t}) \times I(c = \tilde{c}) + \alpha_i + X_{it}\beta + \varepsilon_{itc}$$

Appendix Figure A-3 shows the results from estimating these 4 models using our main sample of West German men, pooling all displacement cohorts. The figure clearly shows that the first specification, that only controls for year effects, has a bump prior to displacement.

The intuition for the bump is that both the displaced and non-displaced workers in a given displacement cohort satisfy a tenure restriction in year  $c$  (at least 3 years of tenure in our case) and thus are typically on an upward earnings profile. After year  $c$  there is no such restrictions and earnings will tend to go down since labor force attachment decreases, worker start working parttime etc. Thus for each cohort  $c$  there is an inverse U-shape around the displacement year. This is something the basic JLS specification cannot capture when pooling cohorts and it produces the pre-displacement bump. Interestingly as one can see from the figure it is enough to control for year-relative-to-displacement-year dummies in addition to the event study dummies. The fact that adding year effects in addition to relative-year effects does not do much is due to the matching, where each displaced worker is matched to one control worker so that years are orthogonal to displacement.

## 3 Decomposing Earnings Losses into Wage and Employment Losses

The results in Figure 1 and 2 in the paper show that displaced workers experience both large employment losses - especially over the short run -, as well as sizable and long-lasting losses. In this appendix section we investigate directly what share of earnings losses after displacement are explained by those two channels using a straightforward formal decomposition. This decomposition is not straightforward for individual-year observations where a worker is not working and thus no wage is observed. We therefore restrict the data for this decomposition on individual-year observations where an individual is working for at least 1 day of the year. This restriction will reduce the estimated employment losses and is closely in line with some other papers' restrictions, such as Lachowska et al. (2019).

The results confirm that long-run earnings losses are mainly explained by long-run wage losses in this sample, whereas in the short run both employment losses and selection into employment play an important role.

Note that earnings  $y$  in a year are the product of the number of days worked by an individual  $N_d$  and the average daily wage in that year  $w$ :  $y = N_d w$ . Taking expectations over the population of displaced workers we get that:

$$E[y] = E[N_d w] = E[N_d] E[w] + Cov(N_d, w)$$

Denote  $y_t^D$  earnings if a person is displaced in year  $t$  after displacement. Denote  $y_t^S$  the counterfactual earnings if a person is not displaced ('stayer'). The earnings losses of a displaced worker are given as:  $\Delta = y_t^S - y_t^D$ . We omit the  $t$  subscript in the following.

Expected earnings losses:

$$\begin{aligned} E[\Delta] &= E[N_d^S w^S] - E[N_d^D w^D] \\ &= E[N_d^S] E[w^S] + Cov(N_d^S, w^S) - E[N_d^D] E[w^D] - Cov(N_d^D, w^D) \\ &= E[N_d^S] E[w^S] - E[N_d^D] E[w^D] + Cov(N_d^S, w^S) - Cov(N_d^D, w^D) \\ &= (E[N_d^S] - E[N_d^D]) E[w^S] + E[N_d^D] (E[w^S] - E[w^D]) + Cov(N_d^S, w^S) - Cov(N_d^D, w^D) \\ &= \Delta E[N_d] E[w^S] + E[N_d^D] \Delta E[w] + \Delta Cov(N_d, w) \end{aligned}$$

Thus the Earnings Loss of a Displaced Worker relative to the Control worker can be written as:

$$E[\Delta] = \Delta E[N_d] E[w^S] + E[N_d^D] \Delta E[w] + \Delta Cov(N_d, w) \quad (1)$$

Expressed as a percentage of stayer earnings:

$$\frac{E[\Delta]}{E[y^S]} = \frac{\Delta E[N_d] E[w^S]}{E[y^S]} + \frac{E[N_d^D] \Delta E[w]}{E[y^S]} + \frac{\Delta Cov(N_d, w)}{E[y^S]}$$

Thus total earnings losses of displaced workers in a given year can be decomposed into three components: 1) the change in days worked between the displaced workers and the control group, 2) the change in wages between the two groups, and 3) the change in the covariance between the two. This last term can be interpreted as the selection of who is employed. If the covariance term becomes larger in the group of displaced workers than in

the control group, this would indicate that job losers with larger losses in days worked have lower wages while workers who work more have the highest wages.

Figure A-6 shows the results of the decomposition in equation (1) over a 14-year period post-displacement.<sup>2</sup> In the first two years after job loss the employment losses explain a substantial share of earnings losses. Wage losses become more important than employment losses in explaining earnings in year three and onwards. Finally, the covariance term is quite striking: it is positive and large in the years following job loss. In the short run, positive selection into who is working the most among displaced workers leads to a 10 percent increase in earnings relative from what would be expected simply from the drop in average wages and average days worked. This term declines over time, however, and in the long run this type of selection plays little role for explaining earnings losses, which eventually are fully explained by the long-run wage losses.

## 4 The Relationship Between Wage Loss and Change in Establishment Effect in the Cross-Section and Measurement Error in the AKM Estimates

Given our matched diff-in-diff estimates of individual level wage losses a straightforward way to test whether changes in establishment effects can explain wage losses is to estimate a simpler version equation (3) in the main text without any controls (except for a quadratic polynomial in calendar year):

$$\Delta_{dd}w_{ic} = \xi \Delta_{dd}\hat{\psi}_J + c\pi_1 + c^2\pi_2 + \varepsilon_{ic} \quad (1)$$

Table A-6 Column (1) shows this simple regression in our main analysis sample. The regression corresponds closely to Figure 5c in the main paper (the standard error is different since Figure 5c is based on data collapsed to the bin level).

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<sup>2</sup> To implement the decomposition we have to drop those worker-year observations where workers are not working at all from this analysis. While the earnings losses are therefore slightly lower than before, the figure still shows very large earnings losses in the first year (t=0) after displacement of more than 35% and a similar recovery pattern.



In the main paper we further control for individual characteristics (such as tenure and experience) of the displaced workers as well as individual and establishment fixed effects.

## 4.1 Measurement Error in Establishment Effects

A particular concern that may arise (we are grateful to an anonymous referee for pointing this out) is that we of course do not know the true individual and establishment fixed effect and instead rely on estimates from the AKM model.

Indeed the estimate in Table A-6 Column (1) shows a coefficient of  $\hat{\xi}$  of only 0.77, substantially lower than a coefficient of 1, which we would expect if we observed the true establishment effect and if the AKM model did indeed fully account for the wage structure. This lower magnitude of 0.77 may be due to attenuation bias of the measurement error as well as due to slight mis-specifications of the AKM model, e.g. if establishment effects drift over time. Using the rolling AKM model (that allow establishment effects to change over time within establishments) we find a slightly lower coefficient (0.74) in Table A-6 Column (4), but the shorter time window may of course exacerbate the measurement error issue in the AKM estimates.

In the main text we therefore address the measurement error in the estimate of the establishment effect  $\hat{\psi}_J$  and the change  $\Delta_{dd}\hat{\psi}_J$  by instrumenting for it using a split sample IV approach. Which works as long as the instrument is uncorrelated with the noise  $\Delta_{dd}w_{ic}$ . Which, for example, is implied if the error term in the AKM model is only serially correlated within individuals.

Column (7) of Table A-6, shows estimates of equation (1) using this split sample IV and

the coefficient increases to 0.81, as expected by the measurement error problem. Furthermore using the estimates from the rolling AKM model combined with the split sample IV approach the coefficient increases further to 0.93, very close to the theoretical value of 1, see column (10).

## 4.2 Measurement Error in Individual Effects

The split sample IV does under plausible assumption solve the issue of measurement error in the establishment effects, but it does not address the potential for measurement error in

the individual effect, which we include in our main specifications as a control for individual heterogeneity.

Consider equation (1) but add in the estimated individual effect:

$$\Delta_{dd}w_{ic} = \xi \Delta_{dd}\hat{\psi}_J + \delta \hat{\alpha}_i + c\pi_1 + c^2\pi_2 + \varepsilon_{ic} \quad (2)$$

The concern is that both  $\Delta_{dd}w_{ic}$  and  $\hat{\alpha}_i$  are of course estimates stemming ultimately from the same underlying wage data and that the noise in each of these estimates is correlated with each other. This may in principle not only bias the estimate of  $\delta$  but also the estimate of  $\xi$  since noise in  $\hat{\alpha}_i$  tends to be negatively correlated with noise in  $\hat{\psi}_J$  (see the limited mobility bias literature) and the outcome variable  $\Delta_{dd}w_{ic}$ .

To address this concern we first show that using alternative controls for individual characteristics barely affect the outcomes. E.g. Table A-6 column (2) and (3) show that while controlling for individual effects or years of education leads to almost the same coefficient estimate  $\hat{\xi}$  (0.75 vs. 0.77). Doing the same in the rolling AKM version leads to identical coefficients (0.74) and again very similar coefficients in the split sample IV versions (columns 8 and 9; as well as 11 and 12).

Thus while this issue may be somewhat important for the estimate of  $\delta$ , our main parameter of interest  $\xi$  is very robust to it.

## 4.3 Monte Carlo Simulation

An alternative way to explore whether using estimated individual effects as a control, we ran a simple monte carlo exercise. To do this we start with the main AKM model data (Universe of Men in West Germany 1980-2008), but randomly simulate establishment and worker effects by drawing from distributions to (very roughly) mimic our empirical estimates.<sup>3</sup>

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<sup>3</sup> Establishment effects are drawn from a normal distribution with a mean of 2.18 and a standard deviation of 0.22; Person effects are drawn from a normal distribution with mean 0 and a standard deviation of 0.3. Then in order to approximate the observed covariance between establishment and individual effects we add: 0.53 times the mean establishment effect for each person to the person effect. In order to generate wage and establishment effects losses among displaced workers we then add a fixed 0.11 to every establishment effect for establishments that experienced a mass layoff at any time (so that mean reversion will lead to a loss post-displacement).

Finally, the simulated log wage is then simply computed as the establishment effect plus worker effect plus a normally distributed error term with a standard deviation of 1.2.

Starting with the actual AKM data has the advantage of having a 'realistic' matrix of establishment transitions and the resulting realistic level of limited mobility bias in the AKM model.

We then estimate the AKM model on this simulated data, which produces to a Var-Covar AKM decomposition of the variance of log wages that at least roughly resembles the actual decomposition in our data.

Finally, we merge these simulated wages, establishment and individual effects (the 'true' simulated effects) as well as the estimates of establishment and individual effects from the AKM model to our analysis sample of displaced workers and compute the same diff-in-diff variables as in the main specifications in order to estimate equations (1) and (2) in the simulated data.

Table A-7 column 1 first shows the simple regression of the simulated wage loss  $\Delta_{dd}w_{ic}$  on the change of the true simulated establishment effect. Unsurprisingly we get a coefficient  $\hat{\xi} = 1.01$ , virtually identical to 1. Adding the true (simulated) worker effect in column (2) has a negligible effect on  $\hat{\xi}$  (now 1.02). Column 3 regresses the simulated wage loss on the estimated change in the (simulated) establishment effect from our AKM model run on the simulated data. The coefficient decreases to  $\hat{\xi} = 0.78$ , consistent with the attenuation bias stemming from limited mobility bias in the AKM model. The magnitude of the attenuation bias is very similar to what we observe in the real data.

Including either the estimated or the simulated person effect (Columns 4 and 5) does not appreciably affect the estimate of  $\xi$ . We then go on to implement the split sample IV strategy in the simulated data (again randomly splitting the AKM data into two equal sized groups of workers). As predicted, the split sample IV fully solves the attenuation bias problem: The estimated coefficient on the (estimated) change in establishment effects becomes  $\hat{\xi} = 1.01$ , essentially identical to the true value of 1! Including either the estimated or the true worker fixed effects as controls does not appreciably affect the coefficient on the change of the establishment effect.

## 5 Implications of the Data Generating Process (DGP) underlying the AKM Model for Job Loss Estimates in Paper

### 5.1 Standard regression model (without matching) and DGP implied by AKM model

#### Standard regression model for cost of job loss (with random control group)

Consider a simplified version of the classic regression model introduced by Jacobson, Lalonde, and Sullivan (1993) for estimating the effect of job loss show in our Online Appendix:

$$w_{itc} = \sum_{k=-5}^{15} \delta_k \times I(t = c + k) \times \text{Disp}_i + \pi_t + \alpha_i + X_{it}\beta + u_{itc}$$

In our analysis of channels we consider the short-term earnings loss (i.e.,  $-3 \leq k \leq 3$ ) such that this can be rewritten as:

$$w_{itc} = \alpha + \delta \text{Disp}_i I(k > 0) + \pi_t + \alpha_i + X_{it}\beta + u_{itc}$$

Taking first differences over time and then taking the difference between treatment and control group, after adapting notation this leads to a version of our main regression equation for the analysis of channels behind the cost of job loss for the case of a random control group (i.e., no matching).

$$\Delta_{dd}w_{ic} = \delta_i + \Delta_{dd}u_{itc}$$

Since  $\Delta_{dd}w_{ic}$  is the difference of the short-run differences in mean pre-post wages and typically the samples are reasonably balanced even without matching, for simplicity we

dropped both the time effects and the time-varying characteristics. Note that we have not yet introduced other controls. Instead, we have introduced an individual subscript on the coefficient of the displacement dummy to signal that we will allow the effect of job loss with a range of characteristics.

For the empirical estimate, we then obtain that the average wage loss with respect to a control group is the mean treatment effect in the sample:

$$E [\Delta_{dd}w_{ic}] = E [\delta_i]$$

### DGP for cost of job loss implied by AKM model

The DGP assumed by the AKM model can be written as

$$w_{it} = \psi_{J(i,t)} + \alpha_i + \theta_t + x'_{it}\beta + \epsilon_{it}$$

Consider the potential outcomes (indexed by superscript  $d \in \{0, 1\}$ ):

$$w_{it}^d = \psi_{J(i,t)}^d + \alpha_i + \theta_t + x'_{it}\beta + \epsilon_{it}^d$$

Since we are mainly interested in the change in wages, it is helpful to rewrite this model in first differences, such that the counterfactual change in wages becomes :

$$\Delta w_{it}^d = \Delta \psi_{J(i,t)}^d + \Delta \theta_t + \Delta x'_{it}\beta + \Delta \epsilon_{it}^d$$

Note that  $\alpha_i$ ,  $\theta_t$  and  $x_{it}$  should not depend on  $d$  by construction. The difference in counterfactual outcomes becomes:

$$\begin{aligned} \Delta_{dd}w_{it} &= \Delta w_{it}^1 - \Delta w_{it}^0 \\ \Delta_{dd}w_{it} &= \Delta_{dd}\hat{\psi}_J + \Delta_{dd}\epsilon_{it} \end{aligned}$$

$$E[\Delta_{dd}w_{it}] = E[\Delta_{dd}\hat{\psi}_J]$$

The result is that for the DGP implied by the AKM model, the entire loss in wages is explained by the change in firm effects before and after job loss.

In other words, if we estimate the main regression model in our paper (without the unemployment rate):

$$\Delta_{dd}w_{ic} = \gamma \hat{\psi}_{J(i,c)} + \xi \Delta_{dd}\hat{\psi}_J + \delta \hat{\alpha}_i + \nu_{ic}$$

the AKM model implies that  $\xi = 1$  and all other coefficients in the model are equal to zero.

## 5.2 Matching and DGP implied by AKM model

This basic intuition holds also in the case of a matching estimator. Among others, this can be seen by the fact that the matching estimator can be rewritten as a reweighted version of the linear OLS estimate of the effect of job loss on wages shown above. In the following, we formally derive the matching estimator for the effect of job loss and relate it to the DGP of the AKM model.

### Potential Outcome Framework

Using the same notation as above, we would like to estimate the loss in wages due to job loss:  $\Delta = w_1 - w_0$ . The problem is of course that the naive estimator:

$E[w_1|d=1] - E[w_0|d=0]$  is a biased estimator since in general the displaced workers are different from non-displaced workers.

If we assume however that conditional on observables  $X$ , outcomes are independent from displacement status:  $w_0 \perp d|X$  then  $E[w_0|d=1, X] = E[w_0|d=0, X]$  and therefore:

$$E[w_1 - w_0|d=1, X] = E[w_1|d=1, X] - E[w_0|d=0, X]$$

Let  $F_{d=1}(x)$  be the distribution of observables  $X$  among the displaced workers. Then integrating over  $X$  we get:

$$\begin{aligned}
\int E[w_1 - w_0 | d = 1, X] dF_{d=1}(x) &= \int E[w_1 | d = 1, X_i] - E[w_0 | d = 0, X_i] dF_{d=1}(x) \\
&= E[w_1 | d = 1] - \int E[w_0 | d = 0, X_i] dF_{d=1}(x)
\end{aligned}$$

### Propensity Score Matching

The wage loss on the individual level is the difference between the two potential outcomes:  $\Delta_i \equiv w_{i,1} - w_{i,0}$ . If the selection on observables assumption holds, we can use propensity score matching to assign a control observation to each displaced worker with the outcome  $w_{i,0}^C$ . This allows us to get calculate an individual level estimate of the treatment effect:  $\tilde{\Delta}_i \equiv w_{i,1} - w_{i,0}^C$  which is an unbiased estimate of  $\Delta_i$  so that:

$$E[\tilde{\Delta}_i] \Rightarrow E[\Delta_i] = \int E[w_1 - w_0 | d = 1, X] dF_{d=1}(x)$$

### Analysis Over the Business Cycle:

Let the state of labor market (good / bad) be indexed by  $L \in \{g, b\}$ . The difference in earnings losses by state of the labor market is:

$$E[\Delta_i | L = g] - E[\Delta_i | L = b]$$

Reweightings earnings losses during booms to characteristics of job losers during recessions (or vice versa) yields

$$E[E[\Delta | L = b, X] | L = g]$$

and the composition adjusted gap becomes

$$E[\Delta_i|L = g] - E[E[\Delta|L = b, X]|L = g].$$

For continuous changes in the state of the labor market indexed by the change in the unemployment rate ( $\Delta UR$ ), the expected earnings losses as a function of observables and state of the labor market can be written succinctly as :

$$E[\Delta_i|\Delta UR, X_i]$$

### Imposing the DGP from AKM Model

Consider the linear projection corresponding to our main analysis:

$$E[\Delta_{dd}w_{it}|\Delta UR, X_i] = \beta \Delta UR_c + \gamma \hat{\psi}_{J(i,c)} + \xi \Delta_{dd}\hat{\psi}_J + \delta \hat{\alpha}_i$$

and the corresponding empirical linear regression model

$$\Delta_{dd}w_{ic} = \beta \Delta UR_c + \gamma \hat{\psi}_{J(i,c)} + \xi \Delta_{dd}\hat{\psi}_J + \delta \hat{\alpha}_i + \varepsilon_{ic}$$

The DGP of the AKM model implies that

$$E[\Delta_{dd}w_{it}|\Delta UR, X_i] = E[\psi_{J(i,t)}^1 - \psi_{J(i,t)}^0|\Delta UR]$$

as long as the aout if the change in the error term  $\Delta_{dd}\epsilon_{it}$  is uncorrelated with  $\Delta UR$ . Similarly, in the notation of our linear regression model, it should be that

$$\Delta_{dd}w_{ic} = \Delta_{dd}\hat{\psi}_J,$$

i.e.,  $\xi = 1$  and all other coefficients should be 0.



## 6 Appendix Tables and Figures

### Tables

**Table A-1: Characteristics of Displaced and Control Workers in Pre-Displacement Year**

	(1) Displaced workers	(2) Non-displaced workers matched	(3) Non-disp. workers random sample
<b>Panel C: Industry (percent)</b>			
A Agriculture, fishing, hunting and forestry	0 [0]	0 [0]	0 [3]
C Manufacturing	62.9 [48.3]	62.9 [48.3]	61.7 [48.6]
D Energy supply	0.9 [9.4]	0.9 [9.4]	2.5 [15.6]
E Water supply and other utilities	0.5 [6.7]	0.5 [6.7]	1.0 [9.7]
F Construction	12.8 [33.5]	12.8 [33.5]	5.4 [22.7]
G Wholesale and retail trade, vehicle repair	10.0 [29.9]	10.0 [29.9]	7.6 [26.6]
H Transport and storage	3.2 [17.7]	3.2 [17.7]	5.4 [22.6]
I Hotels and restaurants	0.09 [3.05]	0.09 [3.05]	0.30 [5.43]
J Information and communication	2.4 [15.4]	2.4 [15.4]	1.8 [13.4]
K Financial and insurance services	1.9 [13.6]	1.9 [13.6]	4.5 [20.7]
L Real estate, renting and business activities	0.06 [2.53]	0.06 [2.53]	0.31 [5.58]
M Personal, technical and scientific services	2.1 [14.4]	2.1 [14.4]	2.5 [15.5]
N Other business services	1.1 [10.3]	1.1 [10.3]	0.7 [8.5]
P Education	0.05 [2.17]	0.05 [2.17]	0.72 [8.46]
Q Health and social work	0.5 [7.0]	0.5 [7.0]	3.6 [18.7]
R Arts and recreation	0.002 [0.458]	0.002 [0.458]	0.481 [6.920]
S Other services	1.4 [11.9]	1.4 [11.9]	1.3 [11.3]
Number of Observations	95,492	95,492	102,468

**Notes:** Characteristics of displaced and non-displaced workers in year prior to displacement year. Workers satisfy the following restrictions: age 24 to 50, working fulltime in pre-displacement year, have at least 3 years of tenure and establishment has at least 50 employees. Non-displaced sample of workers in Column (2) are matched to displaced workers using propensity score matching within year and industry cells. Non-displaced sample of workers in Column (3) is a random sample of workers (one per displaced worker, including workers for whom no match could be found in Column (1) that satisfy the same baseline restrictions. Standard deviations of variables are in brackets.

**Source:** Own calculations.

**Table A-2: Worker Characteristics by Displacement Status the Following Year – 1980-2007**

	(1) Non-displaced workers (matched)	(2) Displaced mass lay-off	(3) Displaced plant closing	(4) Displaced mass lay-off or plant closing
<b>Panel a: Individual Characteristics</b>				
Non-German	0.1 [0.3]	0.2 [0.4]	0.1 [0.3]	0.1 [0.3]
Real wage	93.0 [25.9]	92.3 [26.7]	91.0 [25.4]	91.6 [26.0]
Parttime	0 [0]	0 [0]	0 [0]	0 [0]
Female	0 [0]	0 [0]	0 [0]	0 [0]
West Germany	1 [0]	1 [0]	1 [0]	1 [0]
Years of education	11.0 [2.3]	11.1 [2.4]	10.8 [2.1]	10.9 [2.2]
Potential experience	21.2 [7.4]	20.8 [7.4]	21.7 [7.3]	21.3 [7.4]
Tenure with current Employer	9.6 [5.1]	9.2 [5.1]	9.8 [5.3]	9.5 [5.2]
Actual experience, but censored 1975	13.1 [6.0]	12.8 [6.0]	13.3 [6.2]	13.1 [6.1]
Total yearly earnings	33823.4 [9573.2]	32604.1 [10298.1]	32154.7 [9811.6]	32354.1 [10032.9]
Total yearly income	33848.0 [9548.0]	32885.2 [10058.4]	32518.7 [9543.4]	32681.3 [9776.9]
Days per year working fulltime	363.6 [17.8]	352.2 [37.1]	352.7 [35.8]	352.5 [36.4]
Wage on June 30th of year	93.0 [25.9]	92.3 [26.7]	91.0 [25.4]	91.6 [26.0]
Log of wage in June	4.5 [0.3]	4.5 [0.3]	4.5 [0.3]	4.5 [0.3]
<b>Panel b: Establishment Characteristics</b>				
Number of employees	435.3 [760.6]	477.2 [791.5]	416.3 [768.3]	443.3 [779.3]
Share of fulltime employees	0.9 [0.09]	1.0 [0.08]	1.0 [0.08]	1.0 [0.08]
Establishment FE	2.2 [0.1]	2.2 [0.1]	2.2 [0.1]	2.2 [0.1]
Avg. years of education in estab.	10.8 [1.0]	10.9 [1.1]	10.7 [0.9]	10.8 [1.0]
Number of Spells	95478	42375	53103	95478

**Notes:** Characteristics of displaced and non-displaced workers in year prior to displacement year. Workers satisfy the following restrictions: age 24 to 50, working fulltime in pre-displacement year, have at least 3 years of tenure and establishment has at least 50 employees. Non-displaced workers are matched to displaced workers using propensity score matching algorithm.

**Source:** Own calculations.

**Table A-3: Worker Characteristics by Displacement Status the Following Year – 1980-2007**

	(1) Non-displaced workers	(2) Displaced mass lay-off	(3) Displaced plant closing	(4) Displaced mass lay-off or plant closing
<b>Panel C: Industry (percent)</b>				
C Manufacturing	62.9 [48.3]	61.8 [48.6]	63.8 [48.0]	62.9 [48.3]
D Energy supply	0.9 [9.4]	0.9 [9.3]	0.9 [9.4]	0.9 [9.4]
E Water supply and other utilities	0.5 [6.7]	0.5 [7.3]	0.4 [6.3]	0.5 [6.7]
F Construction	12.8 [33.5]	10.8 [31.0]	14.5 [35.2]	12.8 [33.5]
G Wholesale and retail trade, Vehicle repair	10.0 [29.9]	10.1 [30.2]	9.8 [29.8]	10.0 [29.9]
H Transport and storage	3.2 [17.7]	4.4 [20.5]	2.3 [15.1]	3.2 [17.7]
I Hotels and restaurants	0.09 [3.0]	0.08 [2.7]	0.10 [3.2]	0.09 [3.0]
J Information and communication	2.4 [15.4]	2.9 [16.7]	2.1 [14.3]	2.4 [15.4]
K Financial and insurance services	1.9 [13.6]	1.7 [12.9]	2.0 [14.2]	1.9 [13.6]
L Real estate, renting and business activities	0.06 [2.5]	0.07 [2.7]	0.05 [2.3]	0.06 [2.5]
M Personal, technical and scientific services	2.1 [14.4]	2.7 [16.2]	1.7 [12.8]	2.1 [14.4]
N Other business services	1.1 [10.3]	1.2 [10.8]	1.0 [10.0]	1.1 [10.3]
P Education	0.05 [2.2]	0.07 [2.7]	0.03 [1.7]	0.05 [2.2]
Q Health and social work	0.5 [7.0]	0.6 [7.6]	0.4 [6.5]	0.5 [7.0]
R Arts and recreation	0.002 [0.5]	0.005 [0.7]	0 [0]	0.002 [0.5]
S Other services	1.4 [11.9]	2.3 [14.9]	0.8 [8.9]	1.4 [11.9]
Number of Spells	95478	42375	53103	95478

**Notes:** Characteristics of displaced and non-displaced workers in year prior to displacement year. Workers satisfy the following restrictions: age 24 to 50, working fulltime in pre-displacement year, have at least 3 years of tenure and establishment has at least 50 employees. Non-displaced workers are matched to displaced workers using propensity score matching algorithm.

**Source:** Own calculations.

**Table A-4: The Correlation of Explanatory Variables with the Business Cycle**

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A: Regression of Effect of Job Loss on Year over Year Change in National Unemployment Rate</b>						
	Estimated Effect of Change in UR		Predicted Effect of Change in UR		Difference going from -1% to +1% Change UR	Mean of dependent variable
	Coefficient	Std. Err.	$\Delta UR = -1\%$	$\Delta UR = +1\%$		
Outcome:						
Nonemp. Duration (Years)	0.12	[0.016]	0.19	0.43	0.24	0.35
Occupation change	0.037	[0.0096]	0.23	0.31	0.080	0.28
Industry change	0.072	[0.025]	0.44	0.58	0.14	0.53
Change in Establishment FE	-0.020	[0.0047]	-0.031	-0.071	-0.040	-0.056
Estab FE	-0.0012	[0.0046]	2.23	2.23	0	2.23
Worker FE	-0.021	[0.0093]	-0.0070	-0.049	-0.042	-0.033
<b>Panel B: Regression of Effect of Job Loss on National Unemployment Rate</b>						
	Estimated Effect of Unemployment Rate		Predicted Effect of Unemployment Rate		Difference going from 4% to 9% UR	Mean of dependent variable
	Coefficient	Std. Err.	UR=4%	UR=9%		
Outcome:						
Nonemp. Duration (Years)	0.015	[0.0088]	0.29	0.36	0.070	0.35
Occupation change	-0.010	[0.0042]	0.31	0.26	-0.050	0.28
Industry change	-0.026	[0.0069]	0.62	0.49	-0.13	0.53
Change in Establishment FE	-0.0056	[0.0019]	-0.036	-0.064	-0.028	-0.056
Estab FE	-0.0042	[0.0016]	2.24	2.22	-0.020	2.23
Worker FE	-0.014	[0.0031]	0.013	-0.057	-0.070	-0.033

**Notes:** Each row represents a separate regression of the mean losses in the outcome variable over a three year period after job loss on the year over year change in the national unemployment rate (Panel A). and the level of the national unemployment rate (Panel B). The model is estimated on the yearly level.

**Source:** Own calculations.

**Table A-5: Decomposing the Variance of Log Daily Wages into AKM Components (West German Fulltime Men)**

	(1) Long AKM 1980	(2) Rolling AKM 1980	(3) Kmeans 1980	(4) Long AKM 2009	(5) Rolling AKM 2009	(6) Kmeans 2009
<b>Panel A: Mean of Log Wages</b>						
Log wage	4.3053	4.3323	4.3248	4.3955	4.4168	4.4001
<b>Panel B: AKM Decomposition</b>						
Var of Log Wage	0.1345	0.1138	0.1204	0.2736	0.2613	0.2711
Var[Estab. FE]	0.02685	0.02227	0.01370	0.07373	0.05560	0.04288
Var[Worker FE]	0.1051	0.08745	0.07845	0.09009	0.1524	0.1373
Cov[Worker FE; Estab FE]	-0.007350	-0.01303	0.009515	0.04357	0.03498	0.07021
SD of Estab. FE	0.1639	0.1492	0.1170	0.2715	0.2358	0.2071
SD of Worker effect	0.3241	0.2957	0.2801	0.3001	0.3903	0.3705
Number of Establishments	768,541	619,450	796,804	1,017,976	749,850	1,041,313
Number of Workers	11,262,108	10,556,274	10,805,596	11,271,573	10,661,523	11,156,323
Number of Clusters			39,233			47,719

**Notes:** The decomposition in columns (1) and (4) is based on the pooled AKM model pooling all years from 1979 to 2009. The decomposition in columns (2) and (5) is based on the rolling AKM model that uses only observations from the previous 6 years (up to and including the year in the column heading). Columns (3) and (6) use a hybrid kmeans clustering approach also using the 6 years up to the year in the column heading, where we allow for an establishment fixed effect for establishments with at least 50 employees (in any of the previous 6 years) but classify all establishments with less than 50 employees into 20 clusters using the Bonhomme, Lamadon and Manresa (2019) kmeans-clustering approach. The number of clusters in the last line is then the number of establishments with at least 50 employees plus the 20 clusters. Other wage components, like the role of experience and the respective covariance terms are included in the AKM model but not shown in the table.

**Source:** Own calculations.

**Table A-6: Log Wage Losses and Change in Establishment Effects - Robustness of Main Regression**

	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS	(7) IV	(8) IV	(9) IV	(10) IV	(11) IV	(12) IV
Change Estab FE	0.77 (0.017)**	0.75 (0.018)**	0.77 (0.017)**									
Change Estab FE, Rolling				0.74 (0.019)**	0.74 (0.018)**	0.74 (0.019)**						
Change Estab FE, Split							0.81 (0.017)**	0.78 (0.018)**	0.81 (0.016)**			
Change Estab FE, Split, Rolling										0.93 (0.018)**	0.94 (0.017)**	0.93 (0.018)**
Worker FE		0.072 (0.010)**						0.066 (0.010)**				
Worker FE, Rolling					0.015 (0.0063)*						-0.0023 (0.0059)	
Education years			0.00032 (0.00065)			0.0054 (0.00073)**			0.000097 (0.00066)			0.0043 (0.00075)**
Change in Estab FE coef = 1												
Mean of dep. var	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077
R <sup>2</sup>	0.33	0.34	0.33	0.28	0.28	0.28	0.29	0.29	0.29	0.21	0.21	0.21
N	80917	80917	80917	68484	68476	68484	79983	79983	79983	65230	65222	65230

Notes: Regressions Control for year and year squared.

Source: Own calculations.

**Table A-7: Log Wage Losses and Change in Establishment Effects - Robustness of Main Regression**

	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) IV	(7) IV	(8) IV
Change Estab FE - True	1.01 (0.012)**	1.02 (0.012)**						
Change Estab FE - Est			0.78 (0.013)**	0.78 (0.013)**	0.78 (0.013)**			
Change Estab FE - Est. - Split Sample						1.01 (0.016)**	1.02 (0.015)**	1.01 (0.016)**
Worker FE - True		0.0098 (0.011)			0.0047 (0.011)			0.010 (0.011)
Worker FE - Est.				0.029 (0.013)*			0.027 (0.013)*	
Change in Estab FE coef = 1	-0.078	-0.078	-0.078	-0.078	-0.078	-0.078	-0.078	-0.078
Mean of dep. var	0.083	0.083	0.064	0.064	0.064	0.041	0.041	0.041
R <sup>2</sup>	61386	61386	61386	61386	61386	60791	60791	60791
N								

Notes: Regressions control for year and year squared.  
Simulation uses actual firm by worker combinations for all years but randomly generates worker and establishment effects.

**Source:** Own calculations.



**Table A-8: Wage and Estab FE Changes for Displaced Workers by Inter-quintile Employer Transitions - Comparison with Lachowska et al (2020) Table 4**

Fixed Effects Quintile of Origin Employer		Fixed Effects Quintile of Destination Employer					Row Totals*
		1	2	3	4	5	
Panel A: Aggregating over Entire Sample Period							
1	Percent of Disp. Workers in Cell	0.7	0.6	0.3	0.2	0.1	1.8
	Mean Δ Wage	5.9	1.3	6.9	15.9	23.3	1.6
	Mean Δ Estab FE	7.2	7.7	17.1	28.2	37.9	6.6
2	Percent of Disp. Workers in Cell	1.0	2.0	1.8	1.0	0.5	6.3
	Mean Δ Wage	-18.3	4.7	-0.2	3.9	10.6	-3.1
	Mean Δ Estab FE	-20.9	3.2	5.5	14.5	26.3	1.4
3	Percent of Disp. Workers in Cell	1.3	3.3	5.3	4.4	2.0	16.3
	Mean Δ Wage	-29.5	-11.6	4.2	2.2	7.4	-4.6
	Mean Δ Estab FE	-32.2	-11.9	2.2	6.1	17.1	-1.9
4	Percent of Disp. Workers in Cell	2.0	4.4	8.5	13.7	8.2	36.9
	Mean Δ Wage	-38.5	-18.5	-9.8	-3.1	3.0	-7.1
	Mean Δ Estab FE	-43.1	-20.5	-10.0	-1.2	9.8	-5.4
5	Percent of Disp. Workers in Cell	1.8	3.2	6.0	10.6	17.1	38.7
	Mean Δ Wage	-49.0	-29.2	-19.4	-10.6	-1.5	11.3
	Mean Δ Estab FE	-52.1	-30.8	-19.6	-10.0	2.5	9.7
Column Totals*	Percent of Disp. Workers in Cell	6.9	13.5	21.8	29.8	27.9	100.0
	Mean Δ Wage	33.2	16.4	10.1	4.6	0.8	7.9
	Mean Δ Estab FE	36.4	17.0	9.1	2.5	6.2	5.8
Share of wage change explained by establishment FE change							0.741
Panel B: Reweighted to Quintile Cell Shares in Lachowska et al (2019) Table 4							
1	Percent of Disp. Workers in Cell	5.0	2.0	1.1	0.9	0.8	9.8
	Mean Δ Wage	5.9	1.3	6.9	15.9	23.3	1.4
	Mean Δ Estab FE	7.2	7.7	17.1	28.2	37.9	5.5
2	Percent of Disp. Workers in Cell	2.0	3.9	1.8	1.3	0.4	9.4
	Mean Δ Wage	-18.3	4.7	-0.2	3.9	10.6	-4.9
	Mean Δ Estab FE	-20.9	3.2	5.5	14.5	26.3	-1.6
3	Percent of Disp. Workers in Cell	1.9	4.1	7.4	2.9	2.8	19.1
	Mean Δ Wage	-29.5	-11.6	4.2	2.2	7.4	-5.6
	Mean Δ Estab FE	-32.2	-11.9	2.2	6.1	17.1	-3.2
4	Percent of Disp. Workers in Cell	1.5	2.6	4.2	7.8	3.8	19.9
	Mean Δ Wage	-38.5	-18.5	-9.8	3.1	3.0	-8.0
	Mean Δ Estab FE	-43.1	-20.5	-10.0	1.2	9.8	-6.6
5	Percent of Disp. Workers in Cell	0.4	2.1	2.8	8.5	28.2	42.0
	Mean Δ Wage	-49.0	-29.2	-19.4	-10.6	1.5	-6.3
	Mean Δ Estab FE	-52.1	-30.8	-19.6	-10.0	2.5	-3.7
Column Totals*	Percent of Disp. Workers in Cell	10.8	14.7	17.3	21.4	36.0	100.2
	Mean Δ Wage	18.5	11.7	6.9	4.1	0.4	5.7
	Mean Δ Estab FE	20.8	11.1	4.9	1.5	5.4	3.1
Share of wage change explained by establishment FE change							0.545

**Notes:** The sample is men with at least 3 years of tenure employed at an establishment of size greater or equal 50 displaced between 1980 and 2005 (see text for a definition of displacement). The table shows changes in daily wage and in establishment fixed effects (times 100) for displaced workers transitioning between quintiles of the overall establishment fixed effect distribution. Panel A corresponds to Table 3 in the main paper but pools all years (regardless of state of labor market). Panel B takes the mean wage and establishment effect changes of each cell Panel A but applies the distribution of workers across cells from Lachowska et al. Table 4. \* Row and column totals are the sum of the percentages of the respective row / column, and the weighted averages of the wage and estab. fe changes.

**Source:** Own calculations.

**Table A-9: Wage and Estab FE Changes for Displaced Workers by Inter-quintile Employer Transitions - Comparison with Lachowska et al (2020) Table 4**

Origin Estab FE		Quintile of Destination Estab FE					Row Totals*
		1	2	3	4	5	
Panel A: Original Lachowska et al (2020) Table 4							
1	Percent of Disp. Workers in Cell	5.0	2.0	1.1	0.9	0.8	9.8
	Mean $\Delta$ Wage	16.9	-21.1	-3.4	-10.8	29.0	-11.9
	Mean $\Delta$ Estab FE	1.1	10.8	23.4	37.6	56.4	12.3
2	Percent of Disp. Workers in Cell	2.0	3.9	1.8	1.3	0.4	9.4
	Mean $\Delta$ Wage	-44.7	9.9	-10.3	6.4	3.1	-14.6
	Mean $\Delta$ Estab FE	-19.9	0.7	9.2	21.1	40.3	1.9
3	Percent of Disp. Workers in Cell	1.9	4.1	7.4	2.9	2.8	19.1
	Mean $\Delta$ Wage	-36.6	-28.1	19.7	-9.3	0.3	-18.7
	Mean $\Delta$ Estab FE	-29.9	-11.7	0.9	10.7	30.4	0.2
4	Percent of Disp. Workers in Cell	1.5	2.6	4.2	7.8	3.8	19.9
	Mean $\Delta$ Wage	-55.4	-37.2	-26.8	8.6	7.4	-16.7
	Mean $\Delta$ Estab FE	-40.5	-21.3	-10.3	1.2	20.1	-4.6
5	Percent of Disp. Workers in Cell	0.4	2.1	2.8	8.5	28.2	42.0
	Mean $\Delta$ Wage	-50.5	-48.2	-25.5	-14.6	1.8	-8.8
	Mean $\Delta$ Estab FE	-50.3	-36.8	-26.1	-10.7	0.7	-5.8
Column Totals*	Percent of Disp. Workers in Cell	10.8	14.7	17.3	21.4	36.0	100.2
	Mean $\Delta$ Wage	32.1	26.8	20.3	10.3	0.1	13.1
	Mean $\Delta$ Estab FE	16.9	11.0	4.7	0.4	6.7	1.9
Share of wage change explained by establishment FE change							0.146
Panel B: Lachowska et al (2020) Table 4 - Reweighted to German Cell Weights							
1	Percent of Disp. Workers in Cell	0.7	0.6	0.3	0.2	0.1	1.8
	Mean $\Delta$ Wage	16.9	-21.1	-3.4	-10.8	29.0	-13.6
	Mean $\Delta$ Estab FE	1.1	10.8	23.4	37.6	56.4	12.6
2	Percent of Disp. Workers in Cell	1.0	2.0	1.8	1.0	0.5	6.3
	Mean $\Delta$ Wage	-44.7	9.9	-10.3	6.4	3.1	-12.1
	Mean $\Delta$ Estab FE	-19.9	0.7	9.2	21.1	40.3	5.4
3	Percent of Disp. Workers in Cell	1.3	3.3	5.3	4.4	2.0	16.3
	Mean $\Delta$ Wage	-36.6	-28.1	19.7	-9.3	0.3	-17.5
	Mean $\Delta$ Estab FE	-29.9	-11.7	0.9	10.7	30.4	1.6
4	Percent of Disp. Workers in Cell	2.0	4.4	8.5	13.7	8.2	36.9
	Mean $\Delta$ Wage	-55.4	-37.2	-26.8	8.6	7.4	-15.2
	Mean $\Delta$ Estab FE	-40.5	-21.3	-10.3	1.2	20.1	-3.1
5	Percent of Disp. Workers in Cell	1.8	3.2	6.0	10.6	17.1	38.7
	Mean $\Delta$ Wage	-50.5	-48.2	-25.5	-14.6	1.8	-15.1
	Mean $\Delta$ Estab FE	-50.3	-36.8	-26.1	-10.7	0.7	-12.1
Column Totals*	Percent of Disp. Workers in Cell	6.9	13.5	21.8	29.8	27.9	100.0
	Mean $\Delta$ Wage	44.9	32.8	23.1	10.4	1.2	15.3
	Mean $\Delta$ Estab FE	34.0	18.2	10.3	1.9	9.4	5.0
Share of wage change explained by establishment FE change							0.326

**Notes:** The sample is men with at least 3 years of tenure employed at an establishment of size greater or equal 50 displaced between 1980 and 2005 (see text for a definition of displacement). The table shows changes in daily wage and in establishment fixed effects (times 100) for displaced workers transitioning between quintiles of the overall establishment fixed effect distribution. Panel A replicates Table 4 of Lachowska, Mas and Woodbury (2020). Panel B takes the mean wage and establishment effect changes of each cell in Lachowska et al. Table 4 but applies the distribution of workers across cells from Germany (see previous Table in this Appendix). \* Row and column totals are the sum of the percentages of the respective row / column, and the weighted averages of the wage and estab. fe changes.

**Source:** Own calculations.

**Table A-10: Explaining Log Wage Losses up to 3 Years after Job Loss Controlling for Individual Characteristics - Regressions Pooling All Years, Controlling for Year Effects and Omitting Cyclical Control Variables**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	log wage	log wage	log wage	log wage	log wage	log wage	log wage	log wage	log wage
Establishment FE	-0.30 (0.027)**	-0.017 (0.013)	-0.30 (0.026)**	-0.027 (0.012)*	-0.028 (0.015)	-0.033 (0.013)*	-0.024 (0.013)	-0.27 (0.030)**	-0.046 (0.014)**
Change in Estab FE		0.74 (0.018)**		0.71 (0.017)**	0.70 (0.015)**	0.68 (0.017)**	0.73 (0.018)**		0.63 (0.013)**
Worker FE	0.17 (0.011)**	0.072 (0.010)**	0.13 (0.0094)**	0.058 (0.0098)**	0.059 (0.011)**	0.061 (0.0096)**	0.071 (0.010)**	0.10 (0.0082)**	0.047 (0.010)**
Nonemp. Duration (post Disp)			-0.092 (0.0079)**	-0.051 (0.0041)**				-0.051 (0.0049)**	-0.032 (0.0034)**
Occ. change					-0.023 (0.0033)**			-0.0084 (0.0034)*	0.00018 (0.0030)
Ind. change					-0.029 (0.0024)**			-0.015 (0.0036)**	-0.011 (0.0023)**
Change in Industry Tenure						0.0042 (0.00021)**		0.0055 (0.00033)**	0.0031 (0.00023)**
Change in Occupation Tenure						0.0029 (0.00023)**		0.0029 (0.00028)**	0.0021 (0.00016)**
Parttime - Diff-Diff							-0.36 (0.039)**	-0.36 (0.048)**	-0.34 (0.042)**
Business Service Firm (FCSL)								-0.073 (0.0082)**	-0.022 (0.0061)**
Temp. Agency								-0.26 (0.020)**	-0.11 (0.0086)**
Business Service Firm (Non-FCSLT)								0.013 (0.0049)*	0.018 (0.0039)**
New Establishment								-0.0045 (0.0031)	0.0076 (0.0010)**
Pre-disp Tenure	-0.0054 (0.00083)**	-0.0057 (0.00060)**	-0.0059 (0.00080)**	-0.0060 (0.00059)**	-0.0058 (0.00061)**	-0.0042 (0.00064)**	-0.0057 (0.00061)**	-0.0035 (0.00088)**	-0.0052 (0.00066)**
Tenure squared	0.00014 (0.000024)**	0.00015 (0.000018)**	0.00016 (0.000023)**	0.00016 (0.000018)**	0.00015 (0.000021)**	0.00015 (0.000022)**	0.00015 (0.000018)**	0.00014 (0.000031)**	0.00016 (0.000024)**
Potential experience	-0.0082 (0.00081)**	-0.0079 (0.00066)**	-0.0086 (0.00076)**	-0.0081 (0.00063)**	-0.0083 (0.00064)**	-0.0077 (0.00064)**	-0.0078 (0.00065)**	-0.0085 (0.00080)**	-0.0080 (0.00068)**
Experience squared	0.000076 (0.000018)**	0.000092 (0.000015)**	0.000093 (0.000017)**	0.00010 (0.000015)**	0.000096 (0.000015)**	0.000097 (0.000015)**	0.000091 (0.000015)**	0.000099 (0.000018)**	0.00010 (0.000016)**
Mean of dep. var	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077
R <sup>2</sup>	0.11	0.34	0.14	0.35	0.34	0.36	0.36	0.22	0.37
N	80917	80917	80917	80917	68223	80917	80917	68223	68223

Notes: Regressions control for year dummies, and quadratics in tenure and experience.

Source: Own calculations.

**Table A-11: The Cyclicity of Log Wage Losses - Alternative Year Controls**

	(1) log wage	(2) log wage	(3) log wage	(4) log wage	(5) log wage	(6) log wage
<b>Panel A: Linear Year Control</b>						
Change in UR t-1 to t	-0.030 (0.0011)**	-0.028 (0.0011)**	-0.014 (0.00092)**	-0.0093 (0.00093)**	-0.013 (0.00092)**	-0.0082 (0.00093)**
Establishment FE		-0.31 (0.0078)**			-0.021 (0.0069)**	0.075 (0.0068)**
Worker effect		0.17 (0.0029)**			0.071 (0.0026)**	0.040 (0.0026)**
Change in Estab FE			0.78 (0.0042)**		0.75 (0.0044)**	
Change in Estab FE coef = 1				1		1
Mean of dep. var	-0.077	-0.077		-0.077	-0.077	-0.077
R <sup>2</sup>	0.016	0.070	0.31	0.0042	0.32	0.0087
N	80905	80905	80905	80905	80905	80905
<b>Panel B: Cubic Year Controls</b>						
Change in UR t-1 to t	-0.031 (0.0011)**	-0.028 (0.0011)**	-0.014 (0.00092)**	-0.0093 (0.00093)**	-0.013 (0.00092)**	-0.0082 (0.00093)**
Establishment FE		-0.31 (0.0078)**			-0.026 (0.0069)**	0.069 (0.0068)**
Worker effect		0.17 (0.0029)**			0.072 (0.0026)**	0.040 (0.0026)**
Change in Estab FE			0.78 (0.0042)**		0.75 (0.0044)**	
Change in Estab FE coef = 1				1		1
Mean of dep. var	-0.077	-0.077		-0.077	-0.077	-0.077
R <sup>2</sup>	0.016	0.071	0.31	0.0062	0.32	0.011
N	80905	80905	80905	80905	80905	80905

**Notes:** Regressions control for year. The unemployment rate and the change in the unemployment rate is measured in percentage points and is the unemployment rate for West Germany. Columns (4) and (6) regresses the log wage loss on the unemployment rate (change in UR) controlling for the change in the establishment effect, where the coefficient on the establishment effect is forced to be equal to 1.

**Source:** Own calculations.

**Table A-12: The Cyclicity of Log Wage Losses with and without controlling for establishment effects with different controls for calendar year - Level of Unemployment Rate**

	(1) log wage	(2) log wage	(3) log wage	(4) log wage	(5) log wage	(6) log wage
<b>Panel A: Unemployment Rate - Quadratic Year Controls</b>						
Unemployment rate	-0.0073 (0.00083)**	-0.0050 (0.00080)**	-0.0038 (0.00069)**	-0.0028 (0.00070)**	-0.0035 (0.00069)**	-0.0031 (0.00070)**
Establishment FE		-0.30 (0.0078)**			-0.019 (0.0069)**	0.072 (0.0068)**
Worker effect		0.17 (0.0029)**			0.073 (0.0026)**	0.041 (0.0026)**
Change in Estab FE			0.78 (0.0042)**		0.76 (0.0044)**	
Change in Estab FE coef = 1				1		1
Mean of dep. var	-0.077	-0.077		-0.077	-0.077	-0.077
R <sup>2</sup>	0.0077	0.063	0.31	0.0050	0.32	0.0097
N	80905	80905	80905	80905	80905	80905
<b>Panel B: Unemployment Rate - Cubic Year Controls</b>						
Unemployment rate	-0.0091 (0.00088)**	-0.0069 (0.00086)**	-0.0052 (0.00074)**	-0.0042 (0.00075)**	-0.0049 (0.00074)**	-0.0043 (0.00075)**
Establishment FE		-0.30 (0.0078)**			-0.020 (0.0069)**	0.072 (0.0068)**
Worker effect		0.17 (0.0029)**			0.073 (0.0026)**	0.041 (0.0026)**
Change in Estab FE			0.78 (0.0042)**		0.76 (0.0044)**	
Change in Estab FE coef = 1				1		1
Mean of dep. var	-0.077	-0.077		-0.077	-0.077	-0.077
R <sup>2</sup>	0.0081	0.063	0.31	0.0053	0.32	0.0100
N	80905	80905	80905	80905	80905	80905

Notes: Regressions control for year. The unemployment rate and the change in the unemployment rate is measured in percentage points and is the unemployment rate for West Germany. Columns (5) and (6) regresses the log wage loss on the unemployment rate (change in UR) controlling for the change in the establishment effect, where the coefficient on the establishment effect is forced to be equal to 1.

**Table A-13: The Cyclicalities of Log Wage Losses - Level of Unemployment Rate**

	(1) log wage	(2) log wage	(3) log wage	(4) log wage	(5) log wage	(6) log wage
<b>Panel A: Medium-run wage losses (0-3 Year Post Displacement)</b>						
Unemployment rate	-0.0073 (0.0035)*	-0.0041 (0.0038)	-0.0030 (0.0023)	-0.0020 (0.0020)	-0.0028 (0.0023)	-0.0023 (0.0020)
Establishment FE		-0.29 (0.034)**			-0.014 (0.014)	0.082 (0.015)**
Worker effect		0.17 (0.011)**			0.072 (0.010)**	0.039 (0.012)**
Change in Estab FE			0.77 (0.017)**	1	0.74 (0.019)**	1
Mean of dep. var	-0.077	-0.077		-0.077	-0.077	-0.077
R <sup>2</sup>	0.0077	0.095	0.33	0.033	0.34	0.038
N	80917	80917	80917	80917	80917	80917
<b>Panel B: Long-run wage losses (0-10 Year Post Displacement)</b>						
Unemployment rate	-0.0027 (0.0036)	0.0025 (0.0037)	0.0019 (0.0026)	0.0024 (0.0024)	0.0023 (0.0026)	0.0022 (0.0024)
Establishment FE		-0.39 (0.027)**			0.019 (0.017)	0.11 (0.022)**
Worker effect		0.18 (0.011)**			0.090 (0.012)**	0.070 (0.013)**
Change in Estab FE			0.85 (0.021)**	1	0.82 (0.021)**	1
Mean of dep. var	-0.066	-0.066		-0.066	-0.066	-0.066
R <sup>2</sup>	0.0065	0.11	0.36	0.054	0.37	0.064
N	61227	61227	61227	61227	61227	61227

**Notes:** The sample is men with at least 3 years of tenure employed at an establishment of size greater or equal 50 displaced between 1980 and 2005 (see text for a definition of displacement). The dependent variables is the wage loss 3 years post displacement. Regressions control for year and year squared. The unemployment rate is measured in percentage points and is the unemployment rate for West Germany. Columns (4) and (6) regresses the log wage loss on the unemployment rate (change in UR) controlling for the change in the establishment effect, where the coefficient on the establishment effect is forced to be equal to 1. All regressions control for a quadratic in the calendar year; regressions in columns (2) to (6) also control for a quadratic in years of job tenure at displacement and a quadratic in years of potential labor market experience. Statistical significance: \* indicates  $p \leq 0.05$  and \*\* indicates  $p \leq 0.01$ , SE are clustered on year level.

**Source:** Own calculations.

Table A-14: Effect of Unemployment Rate on Outcomes for Job Losers over 3 years after Job Displacement

	(1) Baseline West Germany Men	(2) Control for Occupation and Industry	(3) Control for Occupation and Industry Tenure	(4) Control for MLF and PCL	(5) Control for Parttime after Jobloss	(6) Control for Change in Estab. Size	(7) Control for Change in Estab. Turnover and Sep. rate	(8) All Controls Simultaneously
<b>Panel A:</b> Raw correlation (controlling for year and year squared only)								
Change in UR t-1 to t	-0.030 (0.0030)**	-0.030 (0.0030)**	-0.030 (0.0030)**	-0.030 (0.0030)**	-0.030 (0.0030)**	-0.030 (0.0030)**	-0.030 (0.0030)**	-0.030 (0.0030)**
R <sup>2</sup>	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
<b>Panel B:</b> Controlling for composition effects (incl. experience, tenure polynomial and variables in column heading)								
Change in UR t-1 to t	-0.028 (0.0036)**	-0.027 (0.0034)**	-0.028 (0.0037)**	-0.028 (0.0035)**	-0.029 (0.0037)**	-0.024 (0.0034)**	-0.027 (0.0035)**	-0.024 (0.0030)**
Establishment FE	-0.30 (0.030)**	-0.35 (0.030)**	-0.30 (0.031)**	-0.30 (0.029)**	-0.30 (0.030)**	-0.30 (0.027)**	-0.27 (0.030)**	-0.33 (0.027)**
Worker effect	0.16 (0.011)**	0.16 (0.013)**	0.17 (0.011)**	0.17 (0.011)**	0.16 (0.011)**	0.17 (0.010)**	0.15 (0.0096)**	0.15 (0.012)**
Pre-disp. occupation tenure			-0.0015 (0.00044)**					-0.0017 (0.00033)**
Pre-disp. industry tenure			-0.00036 (0.00037)					-0.00072 (0.00033)*
Plant closing				0.020 (0.0027)**				0.016 (0.0027)**
Parttime - Diff-Diff					-0.41 (0.049)**			-0.40 (0.047)**
Change in Log(Employment)						0.024 (0.0014)**		
Turnover rate - Diff-Diff							-0.15 (0.017)**	-0.15 (0.017)**
Separation rate - Diff-Diff							0.0037 (0.020)	0.0069 (0.021)
Establishment Size - Diff-Diff								0.0000040 (0.00000038)**
R <sup>2</sup>	0.103	0.109	0.103	0.104	0.121	0.136	0.133	0.162
<b>Panel C:</b> Controlling for change in estab FE and composition effects								
Change in UR t-1 to t	-0.014 (0.0022)**	-0.014 (0.0023)**	-0.014 (0.0023)**	-0.013 (0.0022)**	-0.014 (0.0022)**	-0.014 (0.0022)**	-0.014 (0.0022)**	-0.014 (0.0023)**
Worker effect	0.071 (0.010)**	0.083 (0.012)**	0.075 (0.010)**	0.072 (0.010)**	0.070 (0.010)**	0.072 (0.010)**	0.070 (0.010)**	0.086 (0.012)**
Establishment FE	-0.020 (0.014)	-0.035 (0.018)	-0.018 (0.014)	-0.021 (0.013)	-0.026 (0.013)	-0.023 (0.014)	-0.022 (0.014)	-0.039 (0.017)*
Change in Estab FE	0.74 (0.019)**	0.75 (0.018)**	0.74 (0.019)**	0.74 (0.019)**	0.73 (0.018)**	0.73 (0.019)**	0.72 (0.018)**	0.73 (0.016)**
Pre-disp. occupation tenure			-0.0014 (0.00028)**					-0.0014 (0.00023)**
Pre-disp. industry tenure			-0.00070 (0.00029)*					-0.0010 (0.00023)**
Plant closing				0.014 (0.0020)**				0.012 (0.0020)**
Parttime - Diff-Diff					-0.36 (0.039)**			-0.35 (0.039)**
Change in Log(Employment)						0.0020 (0.00056)**		
Turnover rate - Diff-Diff							-0.045 (0.0071)**	-0.043 (0.0075)**
Separation rate - Diff-Diff							0.032 (0.011)**	0.030 (0.011)*
Establishment Size - Diff-Diff								-0.0000020 (0.00000026)**
R <sup>2</sup>	0.340	0.346	0.341	0.341	0.354	0.340	0.339	0.361

**Notes:** Each column in each panel represents a separate regression of the log wage loss of job losers (based on the individual diff-in-diff estimate) change in the national unemployment rate. All regressions control for year and year squared. Panel (A) does not include other controls, Panel (B) controls for the worker effect and the pre-displacement establishment effect as well as tenure and experience polynomials. Panel (C) is the same as Panel (B) but adds (diff-in-diff) change in the establishment effect. Column 5, Panel (B) and (C) uses a split sample IV estimator to instrument for the establishment FE and the change in the establishment FE

**Source:** Own calculations.

Table A-15: The Cyclicalitly of Log Wage Losses Up to 10 Years After Job Loss Controlling for Individual Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	log wage	log wage	log wage	log wage	log wage	log wage	log wage	log wage	log wage
Change in UR t-1 to t	-0.019 (0.0036)**	-0.0100 (0.0028)**	-0.013 (0.0034)**	-0.0075 (0.0028)*	-0.0100 (0.0028)**	-0.0072 (0.0025)**	-0.0098 (0.0028)**	-0.012 (0.0029)**	-0.0077 (0.0026)**
Establishment FE	-0.39 (0.027)**	0.020 (0.017)	-0.38 (0.026)**	0.013 (0.017)	0.0055 (0.019)	-0.0099 (0.018)	0.14 (0.017)	-0.36 (0.023)**	-0.024 (0.018)
Change in Estab FE		0.82 (0.021)**		0.80 (0.021)**	0.80 (0.020)**	0.74 (0.023)**	0.80 (0.021)**		0.71 (0.020)**
Worker FE	0.18 (0.012)**	0.088 (0.012)**	0.15 (0.010)**	0.078 (0.012)**	0.081 (0.013)**	0.076 (0.011)**	0.086 (0.012)**	0.12 (0.0087)**	0.072 (0.011)**
Nonemp. Duration (post Disp)				-0.032 (0.0027)**				-0.033 (0.0041)**	-0.014 (0.0032)**
Occ. change					-0.0087 (0.0020)**			0.16 (0.0036)**	0.024 (0.0026)**
Ind. change					-0.018 (0.0024)**			-0.0032 (0.0034)	0.0022 (0.0024)
Change in Industry Tenure						0.0051 (0.00025)**		0.0075 (0.00042)**	0.0044 (0.00027)**
Change in Occupation Tenure						0.0029 (0.00016)**		0.0042 (0.00040)**	0.0035 (0.00031)**
Parttime - Diff-Diff							-0.51 (0.028)**	-0.52 (0.030)**	-0.47 (0.028)**
Business Service Firm (FCSL)								-0.088 (0.0085)**	-0.019 (0.0059)**
Temp. Agency								-0.28 (0.032)**	-0.11 (0.015)**
Business Service Firm (Non-FCSLT)								0.025 (0.0066)**	0.032 (0.0066)**
New Establishment								-0.012 (0.0028)**	0.0060 (0.0018)**
Pre-disp Tenure	-0.0027 (0.0012)*	-0.0045 (0.00064)**	-0.0037 (0.0011)**	-0.0049 (0.00064)**	-0.0052 (0.00070)**	-0.0033 (0.00069)**	-0.0045 (0.00072)**	-0.0023 (0.0012)	-0.0044 (0.00081)**
Tenure squared	0.000063 (0.000040)	0.00011 (0.000027)**	0.00010 (0.000038)*	0.00013 (0.000027)**	0.00014 (0.000031)**	0.00014 (0.000034)**	0.00011 (0.000029)**	0.00017 (0.000046)**	0.00018 (0.000039)**
Potential experience	-0.011 (0.0015)**	-0.0098 (0.0010)**	-0.011 (0.0014)**	-0.0099 (0.0010)**	-0.010 (0.0011)**	-0.011 (0.00088)**	-0.0097 (0.0011)**	-0.013 (0.0012)**	-0.011 (0.00092)**
Experience squared	0.000011 (0.000035)**	0.000093 (0.000028)**	0.00012 (0.000034)**	0.000097 (0.000028)**	0.000092 (0.000028)**	0.00014 (0.000025)**	0.000091 (0.000028)**	0.00017 (0.000030)**	0.00013 (0.000026)**
Change in Estab FE coef = 1	0	0	0	0	0	0	0	0	0
Mean of dep. var	-0.066	-0.066	-0.066	-0.066	-0.066	-0.066	-0.066	-0.066	-0.066
R <sup>2</sup>	0.12	0.37	0.14	0.38	0.37	0.40	0.25	0.42	0.42
N	61227	61227	61227	61227	55275	61227	61227	55275	55275

Notes: This table corresponds to Table 5 in the paper but is based on a 10 year post-displacement horizon. For all variable definitions see Table 5. Statistical significance: \* indicates  $p \leq 0.05$  and \*\* indicates  $p \leq 0.01$ . SE are clustered on year level.  
Source: Own calculations.



**Table A-16: Log Wage Loss - Diff-Diff - High Worker FE Sample**

	(1) log wage	(2) log wage	(3) log wage	(4) log wage	(5) log wage	(6) log wage	(7) log wage	(8) log wage	(9) log wage
Change in UR t-1 to t	-0.016 (0.0027)**	-0.011 (0.0024)**	-0.0042 (0.0023)	-0.0074 (0.0024)**	-0.0049 (0.0023)**	-0.0073 (0.0023)**	-0.0043 (0.0023)	0.0021 (0.0031)	0.0023 (0.0030)
Establishment FE	-0.18 (0.025)**	-0.18 (0.022)**	-0.016 (0.016)	-0.0080 (0.019)	-0.013 (0.017)	-0.0081 (0.016)	-0.024 (0.017)	0.13 (0.024)**	0.13 (0.026)**
Change in Estab FE			0.53 (0.014)**	0.54 (0.014)**	0.51 (0.014)**	0.56 (0.015)**	0.49 (0.013)**		
Worker FE	0.088 (0.015)**	0.071 (0.013)**	0.021 (0.013)	0.025 (0.014)	0.026 (0.013)	0.028 (0.013)	0.019 (0.013)	-0.023 (0.014)	-0.025 (0.015)
Nonemp. Duration (post Disp)		-0.11 (0.0083)**	-0.077 (0.0065)**				-0.054 (0.0064)**	-0.045 (0.0064)**	-0.030 (0.0066)**
Occ. change				-0.015 (0.0043)**			0.011 (0.0041)**		0.019 (0.0045)**
Ind. change				-0.023 (0.0036)**			-0.0058 (0.0038)	-0.0022 (0.0044)	-0.0022 (0.0044)
Change in Industry Tenure					0.0040 (0.00025)**		0.0029 (0.00028)**	0.0015 (0.00030)**	0.0015 (0.00030)**
Change in Occupation Tenure					0.0028 (0.00033)**		0.0025 (0.00042)**	0.0015 (0.00043)**	0.0015 (0.00043)**
Parttime - Diff-Diff						-0.39 (0.037)**	-0.38 (0.041)**	-0.36 (0.040)**	-0.36 (0.040)**
Pre-disp Tenure	-0.0040 (0.0011)**	-0.0047 (0.0011)**	-0.0052 (0.00093)**	-0.0050 (0.0011)**	-0.0037 (0.00091)**	-0.0047 (0.00093)**	-0.0044 (0.0010)**	-0.0055 (0.0011)**	-0.0053 (0.0012)**
Tenure squared	0.000076 (0.000048)	0.00010 (0.000043)*	0.00012 (0.000032)**	0.00011 (0.000040)**	0.00010 (0.000029)**	0.00010 (0.000033)**	0.00012 (0.000034)**	0.00013 (0.000036)**	0.00015 (0.000042)**
Potential experience	-0.011 (0.00078)**	-0.011 (0.00071)**	-0.011 (0.00080)**	-0.011 (0.00083)**	-0.010 (0.00084)**	-0.010 (0.00083)**	-0.011 (0.00084)**	-0.010 (0.00094)**	-0.011 (0.00094)**
Experience squared	0.00011 (0.000019)**	0.00013 (0.000016)**	0.00013 (0.000018)**	0.00013 (0.000019)**	0.00013 (0.000019)**	0.00012 (0.000019)**	0.00014 (0.000018)**	0.00014 (0.000021)**	0.00015 (0.000021)**
Change in Estab FE coef = 1	0	0	0	0	0	0	0	1	1
Mean of dep. var	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077
R <sup>2</sup>	0.095	0.13	0.26	0.25	0.27	0.26	0.29	0.072	0.093
N	33141	33141	33141	28290	33141	33141	28290	33141	28290

**Notes:** Regressions Control for year and year squared. Columns (2) - (7) also control for tenure dummies  
UR and Change UR are measured in percentage points

**Source:** Own calculations.

Table A-17: Log Wage Loss - Diff-Diff - Low Worker FE Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	log wage	log wage	log wage	log wage	log wage	log wage	log wage	log wage	log wage
Change in UR t-1 to t	-0.037 (0.0045)**	-0.029 (0.0040)**	-0.015 (0.0022)**	-0.017 (0.0023)**	-0.015 (0.0022)**	-0.019 (0.0023)**	-0.014 (0.0021)**	-0.012 (0.0022)**	-0.011 (0.0021)**
Establishment FE	-0.43 (0.034)**	-0.42 (0.034)**	-0.038 (0.014)*	-0.043 (0.017)*	-0.052 (0.016)**	-0.039 (0.015)*	-0.066 (0.017)**	0.050 (0.014)**	0.049 (0.017)**
Change in Estab FE			0.81 (0.017)**	0.80 (0.014)**	0.77 (0.017)**	0.83 (0.018)**	0.75 (0.014)**		
Worker FE	0.27 (0.018)**	0.20 (0.016)**	0.098 (0.016)**	0.097 (0.015)**	0.093 (0.014)**	0.12 (0.014)**	0.070 (0.015)**	0.075 (0.018)**	0.050 (0.018)*
Nonemp. Duration (post Disp)		-0.083 (0.0085)**	-0.039 (0.0042)**				-0.023 (0.0037)**	-0.029 (0.0041)**	-0.015 (0.0035)**
Occ. change				-0.025 (0.0032)**			-0.0013 (0.0039)		0.0020 (0.0040)
Ind. change				-0.032 (0.0027)**			-0.017 (0.0027)**		-0.015 (0.0027)**
Change in Industry Tenure					0.0040 (0.00023)**		0.0030 (0.00025)**		0.0014 (0.00024)**
Change in Occupation Tenure					0.0030 (0.00023)**		0.0023 (0.00028)**		0.0022 (0.00028)**
Parttime - Diff-Diff						-0.34 (0.047)**	-0.32 (0.049)**		-0.31 (0.046)**
Pre-disp Tenure	-0.0047 (0.0013)**	-0.0051 (0.0013)**	-0.0058 (0.00097)**	-0.0054 (0.0010)**	-0.0038 (0.0010)**	-0.0056 (0.00099)**	-0.0041 (0.0012)**	-0.0060 (0.00096)**	-0.0047 (0.0011)**
Tenure squared	0.00012 (0.000041)**	0.00014 (0.000040)**	0.00016 (0.000035)**	0.00013 (0.000039)**	0.00015 (0.000042)**	0.00015 (0.000035)**	0.00014 (0.000045)**	0.00016 (0.000036)**	0.00014 (0.000042)**
Potential experience	-0.0047 (0.0013)**	-0.0051 (0.0013)**	-0.0052 (0.00090)**	-0.0053 (0.00097)**	-0.0049 (0.00085)**	-0.0050 (0.00092)**	-0.0051 (0.0010)**	-0.0053 (0.00087)**	-0.0050 (0.00097)**
Experience squared	0.0000067 (0.000029)	0.000029 (0.000029)	0.000053 (0.000022)*	0.000044 (0.000023)	0.000051 (0.000021)*	0.000044 (0.000022)	0.000052 (0.000024)*	0.000059 (0.000021)*	0.000056 (0.000024)*
Change in Estab FE coef = 1	0	0	0	0	0	0	0	1	1
Mean of dep. var	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077
R <sup>2</sup>	0.079	0.11	0.38	0.38	0.39	0.39	0.40	0.033	0.064
N	47764	47764	47764	39923	47764	47764	39923	47764	39923

Notes: Regressions Control for year and year squared. Columns (2) - (7) also control for tenure dummies.

UR and Change UR are measured in percentage points.

Source: Own calculations.

**Table A-18: The Cyclicity of Log Wage Losses - Random Control Group (No Matching)**

	(1) log wage	(2) log wage	(3) log wage	(4) log wage	(5) log wage	(6) log wage
<b>Panel A: Medium-run wage losses (0-3 Year Post Displacement)</b>						
Change in UR t-1 to t	-0.033 (0.0032)**	-0.030 (0.0037)**	-0.016 (0.0020)**	-0.011 (0.0021)**	-0.015 (0.0021)**	-0.0098 (0.0021)**
Establishment FE		-0.30 (0.034)**			-0.023 (0.017)	0.070 (0.015)**
Worker effect		0.17 (0.013)**			0.076 (0.011)**	0.044 (0.012)**
Change in Estab FE			0.78 (0.018)**	1	0.75 (0.020)**	1
Mean of dep. var	-0.085	-0.085		-0.085	-0.085	-0.085
R <sup>2</sup>	0.016	0.11	0.35	0.039	0.35	0.045
N	86435	86435	86435	86435	86435	86435
<b>Panel B: Long-run wage losses (0-10 Year Post Displacement)</b>						
Change in UR t-1 to t	-0.026 (0.0029)**	-0.021 (0.0036)**	-0.013 (0.0021)**	-0.011 (0.0020)**	-0.011 (0.0024)**	-0.0088 (0.0022)**
Establishment FE		-0.40 (0.032)**			0.0072 (0.019)	0.093 (0.023)**
Worker effect		0.19 (0.015)**			0.093 (0.013)**	0.073 (0.013)**
Change in Estab FE			0.86 (0.020)**	1	0.83 (0.020)**	1
Mean of dep. var	-0.078	-0.078		-0.078	-0.078	-0.078
R <sup>2</sup>	0.0099	0.13	0.37	0.062	0.38	0.072
N	65205	65205	65205	65205	65205	65205

**Notes:** The sample is men with at least 3 years of tenure employed at an establishment of size greater or equal 50 displaced between 1980 and 2005 (see text for a definition of displacement). The dependent variables is the wage loss 3 years post displacement. Regressions control for year and year squared. The change in the unemployment rate is measured in percentage points and is the unemployment rate for West Germany. Columns (4) and (6) regresses the log wage loss on the unemployment rate (change in UR) controlling for the change in the establishment effect, where the coefficient on the establishment effect is forced to be equal to 1. All regressions control for a quadratic in the calendar year; regressions in columns (2) to (6) also control for a quadratic in years of job tenure at displacement and a quadratic in years of potential labor market experience. Statistical significance: \* indicates  $p \leq 0.05$  and \*\* indicates  $p \leq 0.01$ , SE are clustered on year level.

**Source:** Own calculations.

**Table A-19: The Cyclicalities of Log Wage Losses - Alternative Ways to Control for Individual Heterogeneity**

	(1) log wage	(2) log wage	(3) log wage	(4) log wage	(5) log wage	(6) log wage
<b>Panel A: Controlling for Years of Education</b>						
Change in UR t-1 to t	-0.030 (0.0030)**	-0.031 (0.0036)**	-0.015 (0.0022)**	-0.0095 (0.0022)**	-0.015 (0.0022)**	-0.0094 (0.0022)**
Establishment FE		-0.30 (0.034)**			-0.0048 (0.014)	0.087 (0.014)**
Change in Estab FE			0.77 (0.017)**	1	0.76 (0.018)**	1
Education years		0.0094 (0.0011)**			0.00027 (0.00068)	-0.0025 (0.00074)**
Mean of dep. var	-0.077	-0.077		-0.077	-0.077	-0.077
R <sup>2</sup>	0.016	0.074	0.33	0.034	0.33	0.037
N	80917	80917	80917	80917	80917	80917
<b>Panel B: Controlling for Education Dummies</b>						
Change in UR t-1 to t	-0.030 (0.0030)**	-0.031 (0.0036)**	-0.015 (0.0022)**	-0.0095 (0.0022)**	-0.014 (0.0022)**	-0.0094 (0.0022)**
Establishment FE		-0.30 (0.034)**			-0.0041 (0.014)	0.087 (0.014)**
Change in Estab FE			0.77 (0.017)**	1	0.76 (0.018)**	1
Abitur /		0.048			0.016	0.0059
Apprenticeship		(0.0059)**			(0.0030)**	(0.0035)
Some college		0.064 (0.0072)**			0.013 (0.0064)*	-0.0021 (0.0068)
University Degree		0.065 (0.0093)**			-0.0099 (0.0048)*	-0.033 (0.0052)**
Change in Estab FE coef = 1				1		1
Mean of dep. var	-0.077	-0.077		-0.077	-0.077	-0.077
R <sup>2</sup>	0.016	0.074	0.33	0.034	0.33	0.038
N	80917	80917	80917	80917	80917	80917
<b>Panel C: Controlling for log Wage in t=c-1</b>						
Change in UR t-1 to t	-0.030 (0.0030)**	-0.032 (0.0035)**	-0.015 (0.0022)**	-0.0095 (0.0022)**	-0.014 (0.0020)**	-0.0090 (0.0020)**
Establishment FE		-0.32 (0.031)**			0.10 (0.016)**	0.21 (0.011)**
Change in Estab FE			0.77 (0.017)**	1	0.80 (0.019)**	1
Baseline Wage		0.040 (0.015)*			-0.10 (0.0048)**	-0.14 (0.0049)**
Change in Estab FE coef = 1				1		1
Mean of dep. var	-0.077	-0.077		-0.077	-0.077	-0.077
R <sup>2</sup>	0.016	0.068	0.33	0.034	0.34	0.060
N	80917	80917	80917	80917	80917	80917

**Notes:** The sample is men with at least 3 years of tenure employed at an establishment of size greater or equal 50 displaced between 1980 and 2005 (see text for a definition of displacement). The dependent variables is the wage loss 3 years post displacement compared to the control. The change in the unemployment rate is measured in percentage points and is the unemployment rate for West Germany. Columns (4) and (6) regresses the log wage loss on the unemployment rate (change in UR) controlling for the change in the establishment effect, where the coefficient on the establishment effect is forced to be equal to 1. All regressions control for a quadratic in the calendar year; regressions in columns (2) to (6) also control for a quadratic in years of job tenure at displacement and a quadratic in years of potential labor market experience.

Statistical significance: \* indicates  $p \leq 0.05$  and \*\* indicates  $p \leq 0.01$ , SE are clustered on year level.

**Source:** Own calculations.

**Table A-20: Estimates of the Cyclicity of Log Wage - Losses Based on the Simple Difference (without Control Observation)**

	(1) log wage	(2) log wage	(3) log wage	(4) log wage	(5) log wage	(6) log wage
<b>Panel A: Medium-run wage losses (0-3 Year Post Displacement)</b>						
Change in UR t-1 to t	-0.044 (0.0041)**	-0.042 (0.0046)**	-0.029 (0.0046)**	-0.023 (0.0047)**	-0.028 (0.0045)**	-0.022 (0.0047)**
Establishment FE		-0.31 (0.032)**			-0.047 (0.016)**	0.066 (0.014)**
Worker effect		0.18 (0.012)**			0.092 (0.010)**	0.055 (0.012)**
Change in Estab FE			0.74 (0.018)**	1	0.70 (0.019)**	1
Mean of dep. var	-0.020	-0.020		-0.020	-0.020	-0.020
R <sup>2</sup>	0.041	0.16	0.40	0.068	0.41	0.076
N	80917	80917	80917	80917	80917	80917
<b>Panel B: Long-run wage losses (0-10 Year Post Displacement)</b>						
Change in UR t-1 to t	-0.038 (0.0045)**	-0.034 (0.0056)**	-0.029 (0.0049)**	-0.025 (0.0048)**	-0.026 (0.0050)**	-0.023 (0.0049)**
Establishment FE		-0.41 (0.030)**			-0.053 (0.018)**	0.091 (0.020)**
Worker effect		0.20 (0.012)**			0.12 (0.011)**	0.088 (0.012)**
Change in Estab FE			0.76 (0.018)**	1	0.71 (0.019)**	1
Mean of dep. var	0.016	0.016		0.016	0.016	0.016
R <sup>2</sup>	0.043	0.20	0.42	0.11	0.44	0.13
N	61227	61227	61227	61227	61227	61227

**Notes:** The sample is men with at least 3 years of tenure employed at an establishment of size greater or equal 50 displaced between 1980 and 2005 (see text for a definition of displacement). The dependent variables is the wage loss 3 years post displacement compared to the control. The change in the unemployment rate is measured in percentage points and is the unemployment rate for West Germany. Columns (4) and (6) regresses the log wage loss on the unemployment rate (change in UR) controlling for the change in the establishment effect, where the coefficient on the establishment effect is forced to be equal to 1. All regressions control for a quadratic in the calendar year; regressions in columns (2) to (6) also control for a quadratic in years of job tenure at displacement and a quadratic in years of potential labor market experience.

Statistical significance: \* indicates  $p \leq 0.05$  and \*\* indicates  $p \leq 0.01$ , SE are clustered on year level.

**Source:** Own calculations.

**Table A-21: Estimates of the Cyclicity of Job Loss and the Role of Establishment Effects Using Alternative Regional Measures of Unemployment Rate**

	(1) log wage	(2) log wage	(3) log wage	(4) log wage	(5) log wage	(6) log wage
<b>Panel A: State Unemployment - State FE</b>						
Change State UR	-0.027 (0.0058)**	-0.024 (0.0046)**	-0.0072 (0.0037)	-0.0013 (0.0035)	-0.0089 (0.0036)*	-0.0033 (0.0038)
Establishment FE		-0.30 (0.027)**			-0.016 (0.013)	0.085 (0.016)**
Worker effect		0.17 (0.012)**			0.072 (0.010)**	0.039 (0.012)**
Change in Estab FE			0.76 (0.017)**	1	0.74 (0.018)**	1
Mean of dep. var	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077
R <sup>2</sup>	0.020	0.11	0.34	0.036	0.34	0.041
N	80917	80917	80917	80917	80917	80917
<b>Panel B: State Unemployment - Year and State FE</b>						
Change State UR	-0.024 (0.0069)**	-0.020 (0.0052)**	-0.0057 (0.0040)	-0.00017 (0.0036)	-0.0066 (0.0039)	-0.0018 (0.0039)
Establishment FE		-0.30 (0.027)**			-0.013 (0.013)	0.091 (0.016)**
Worker effect		0.17 (0.011)**			0.073 (0.010)**	0.040 (0.012)**
Change in Estab FE			0.76 (0.017)**	1	0.74 (0.018)**	1
Mean of dep. var	-0.077	-0.077	-0.077	-0.077	-0.077	-0.077
R <sup>2</sup>	0.022	0.11	0.34	0.037	0.34	0.042
N	80917	80917	80917	80917	80917	80917

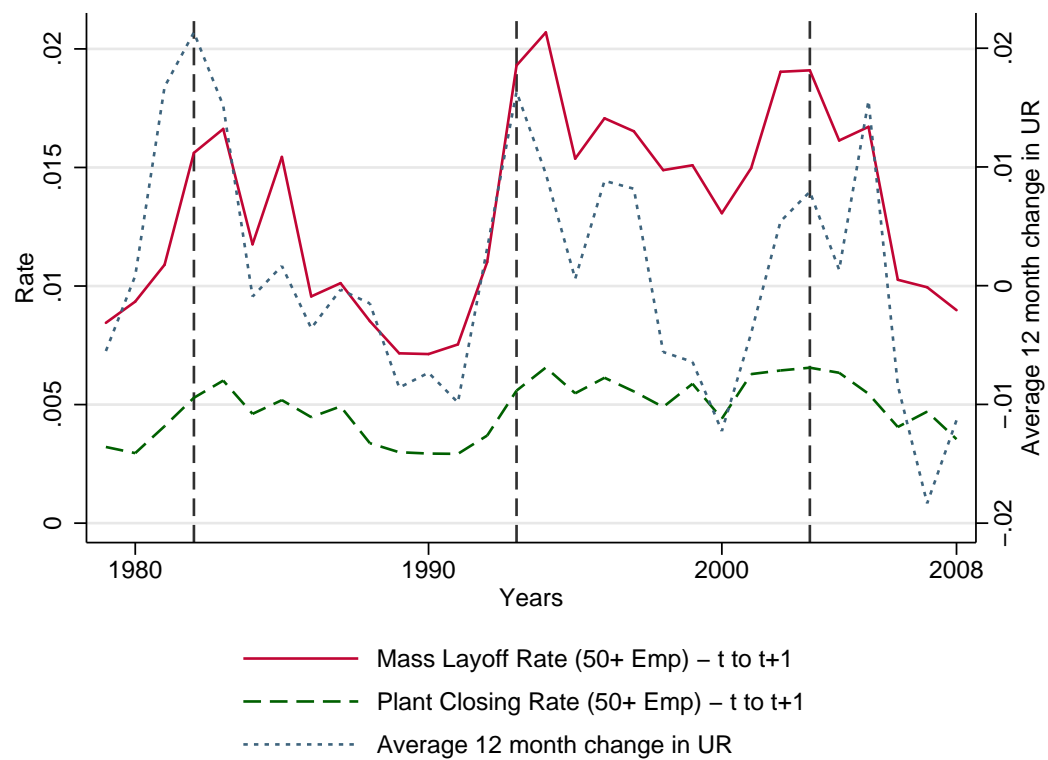
**Notes:** The sample is men with at least 3 years of tenure employed at an establishment of size greater or equal 50 displaced between 1980 and 2005 (see text for a definition of displacement). The dependent variables is the wage loss 3 years post displacement compared to the control. Panels A and B use the state unemployment rate while Panels C and D the county unemployment rate. All regressions control for year fixed effects. Panel B also controls for state fixed effects and Panel D for county fixed effects. Columns (4) and (6) control for the change in the establishment effect, where the coefficient on the establishment effect is forced to be equal to 1. Regressions in columns (2) to (6) also control for a quadratic in years of job tenure at displacement and a quadratic in years of potential labor market experience.

Statistical significance: \* indicates  $p \leq 0.05$  and \*\* indicates  $p \leq 0.01$ , SE are clustered on year level.

**Source:** Own calculations.

## Figures

**Figure A-1: Mass Layoff and Plant Closing Rates by Year**

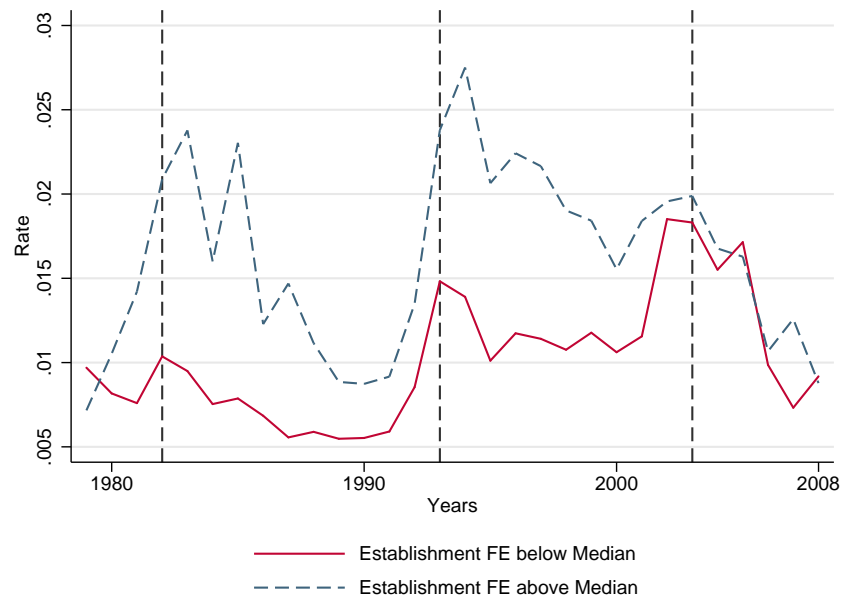


**Notes:** The figure shows rate of mass lay-offs, the rate of plant closings and the year over year change in the unemployment rate in West Germany.

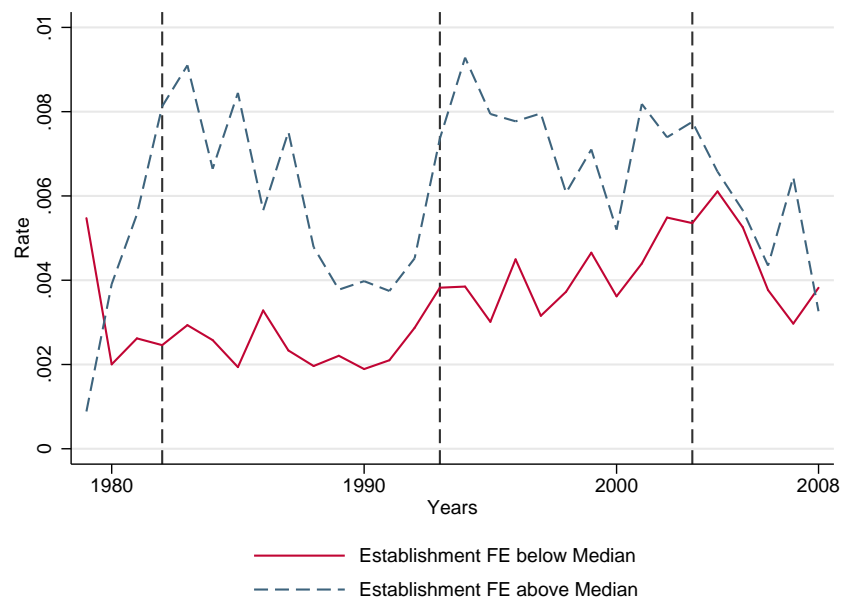
**Source:** Own calculations.



**Figure A-2: Incidence of Job Loss by Establishment Fixed Effect**



(a) Mass Layoff Rate by Year

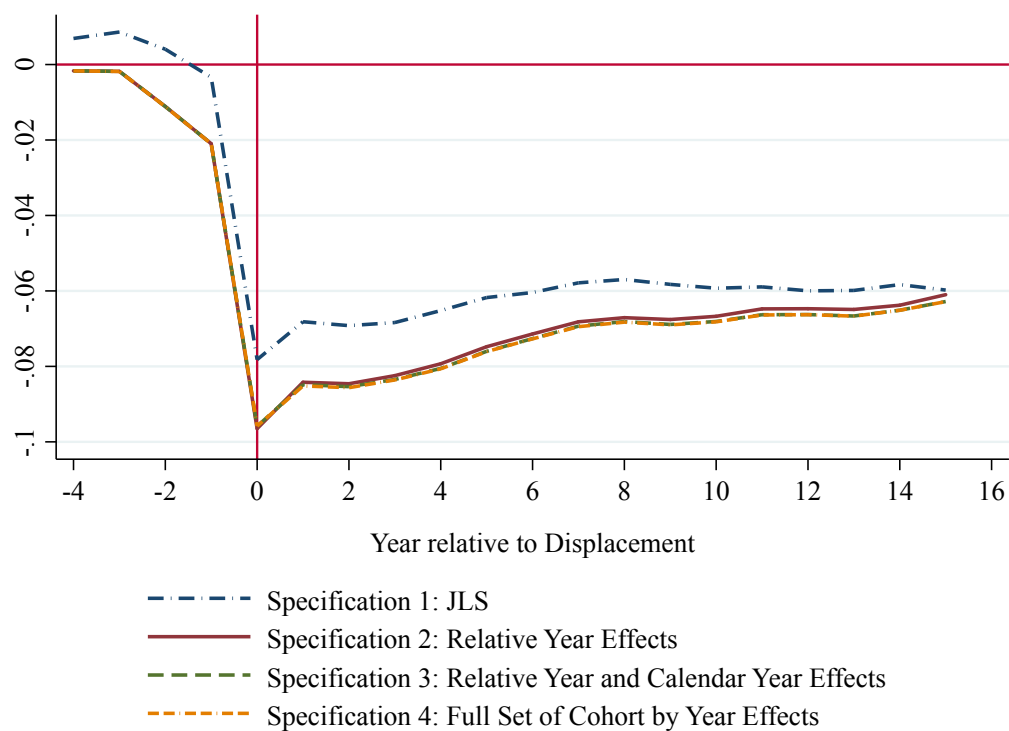


(b) Plant Closing Rate by Year

**Notes:** The figure shows rate of mass lay-offs and the rate of plant closings among establishments with at least 50 employees in West Germany. Each figure shows the rate separately for establishments with high (above median) and low (below median) establishment effects based on the establishment effects distribution in each respective year.

**Source:** Own calculations.

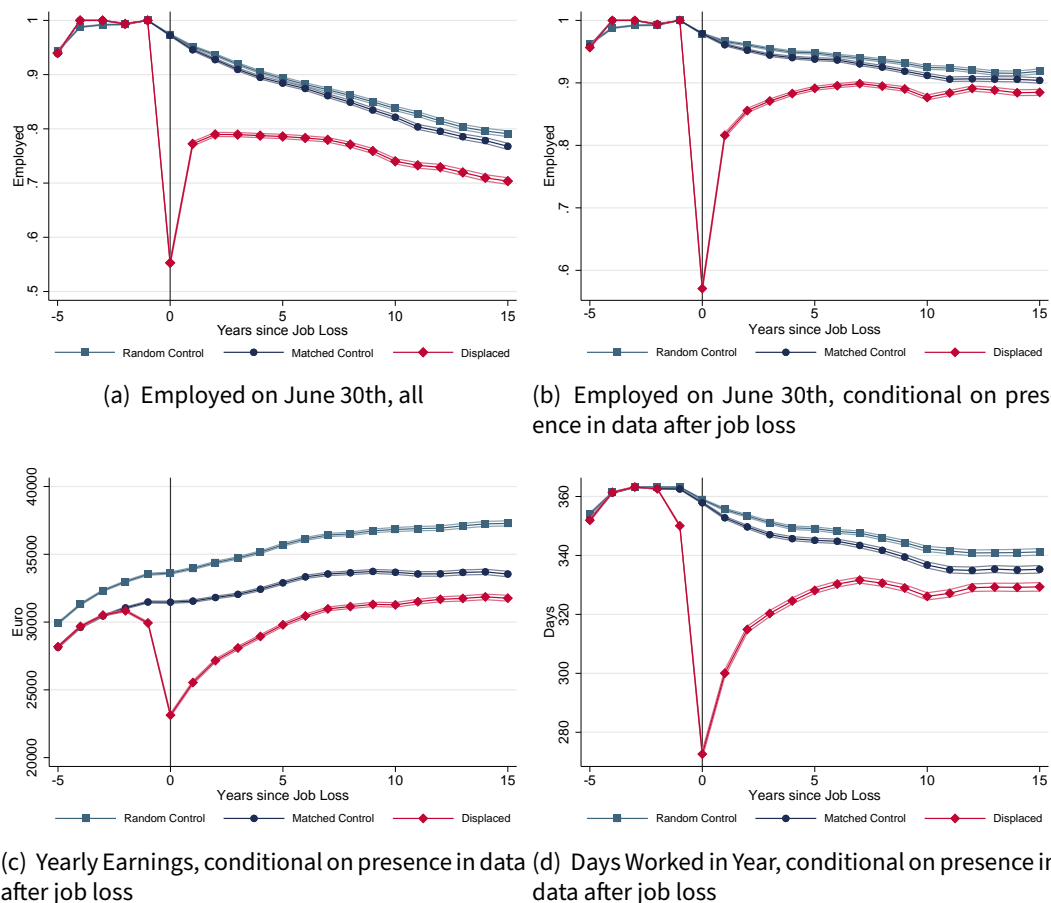
**Figure A-3: Comparing Alternative Job Loss Event Study Specifications**



**Notes:** The figures shows even study estimates of the effects of job loss on log wages comparing alternative regression specifications. The sample is the baseline sample from the main paper (West-German Men, Pooling all displacement years). See Appendix Section 2 for details of the regression specifications.

**Source:** Own calculations.

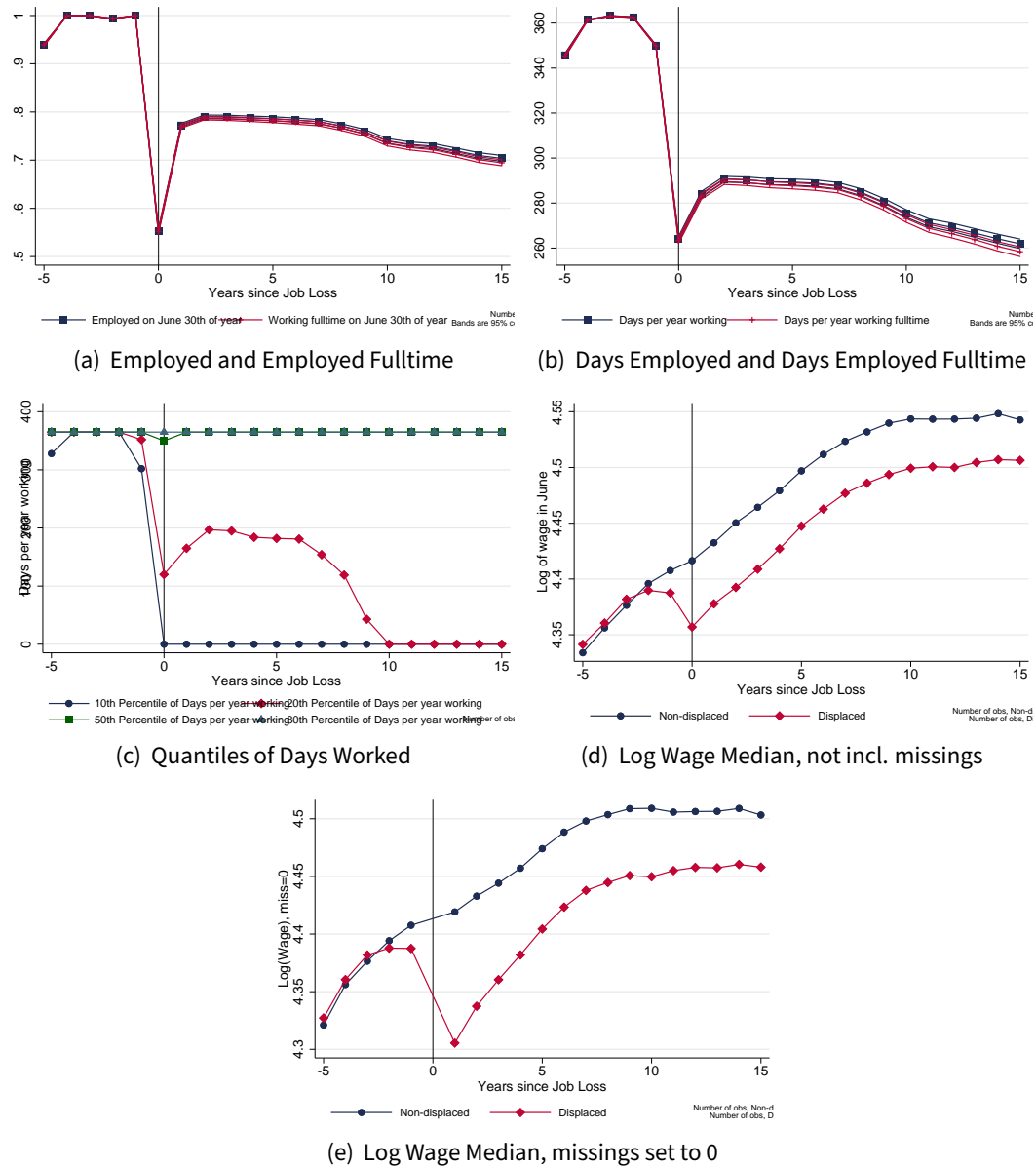
**Figure A-4: Labor Market Outcomes of Displaced Workers before and after Job Loss Imposing Presence in the Data After Job Loss**



**Notes:** The figures shows labor market outcomes for displaced and non-displaced workers. Panels (b) to (d) keep only workers who are observed at least once in each year, either in employment or UI. Panel (a) shows whether a worker is employed on June 30th of the respective year for all workers (entering as 0 if not observed in any labor market state). The red line (diamonds) corresponds to workers who are displaced from year -1 to 0, the navy line (circles) corresponds to the matched control group that is constructed of non-displaced workers via propensity score matching, and the light blue line corresponds to a control group of random workers that satisfy the baseline restrictions. Each point represents the average value in the respective worker group. The figure is constructed pooling workers displaced between 1979 and 2008, while the outcome data spans 1975-2009.

**Source:** Own calculations.

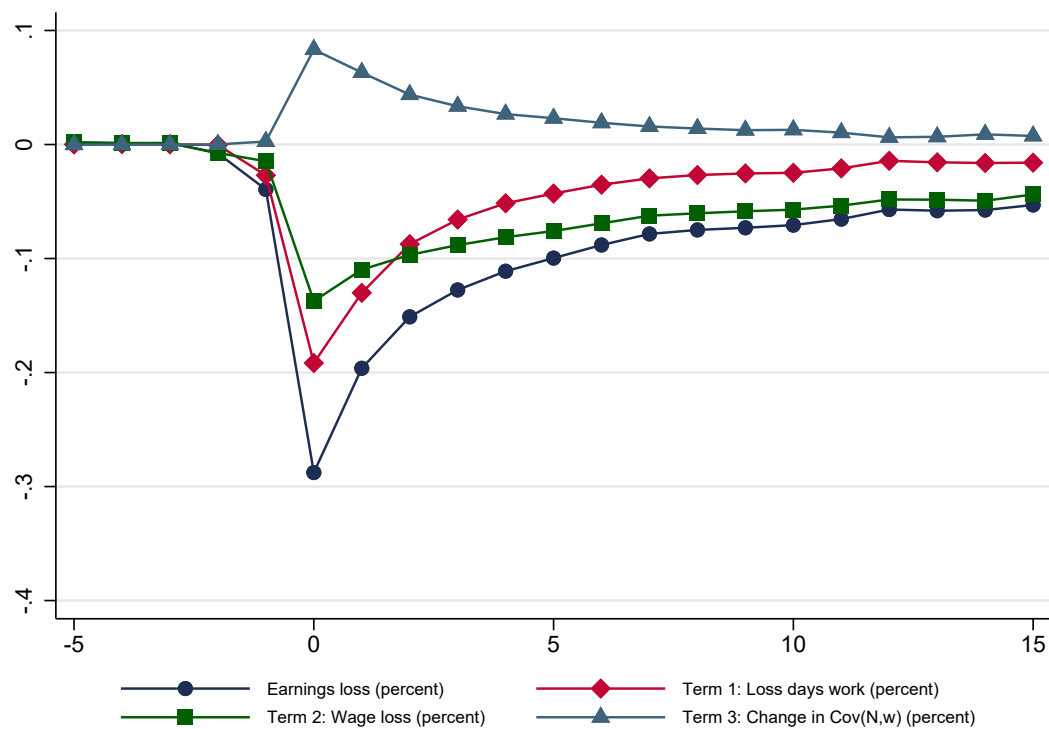
**Figure A-5: The Effect of Job Displacement on Fulltime , Days worked and Median Wages**



**Notes:** The figures shows labor market outcomes for displaced and non-displaced workers. The red line corresponds to workers who are displaced from year -1 to 0. Each point represents the average value in the respective worker group. The figure is constructed pooling workers displaced between 1979 and 2008, while the outcome data spans 1975-2009.

**Source:** Own calculations.

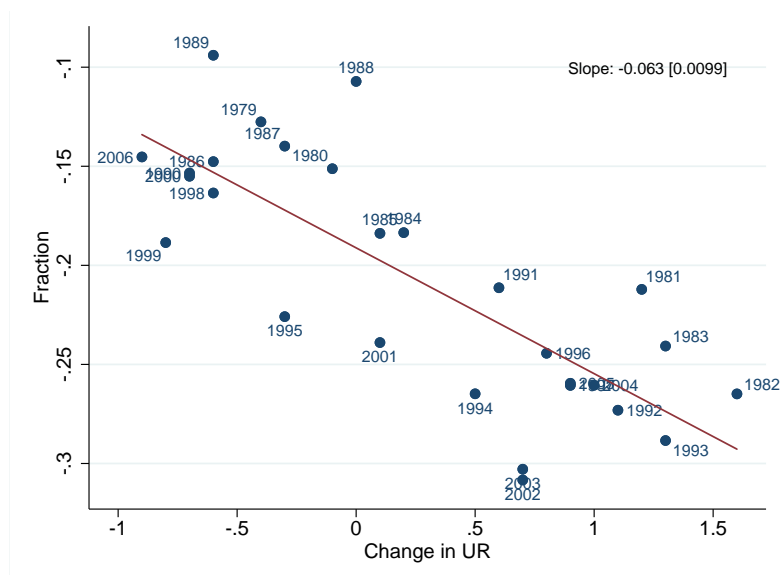
Figure A-6: Decomposition of Earnings Loss into Wage Loss, Loss in Days Worked and Covariance



**Notes:** The figure decomposes earnings losses after job loss into three components: 1) the change in days worked between the displaced workers and the control group, 2) the change in wages between the two groups, and 3) the change in the covariance between the two. See Appendix Section 3 for details.

**Source:** Own calculations.

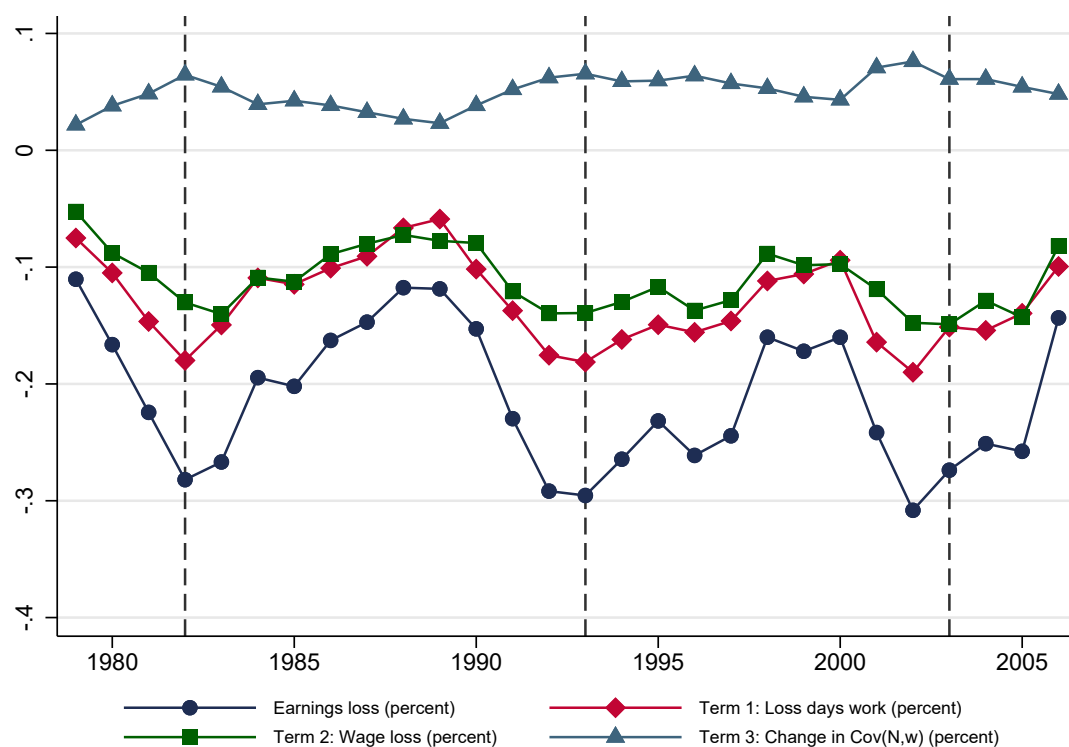
**Figure A-7: Fraction of Annual Earnings Lost 3 Years After Displacement by Year of Job Loss vis-a-vis National Unemployment Rate at Job Loss - Men**



**Notes:** The figure shows scatterplots of the earnings and wage losses of job losers collapsed to the year level relative to the year over year change in the unemployment rate. The top figure shows the percent change in average annual earnings. The bottom figure shows the change in average log wages. Both figures also show a regression line and the estimated slope and SE.

**Source:** Own calculations.

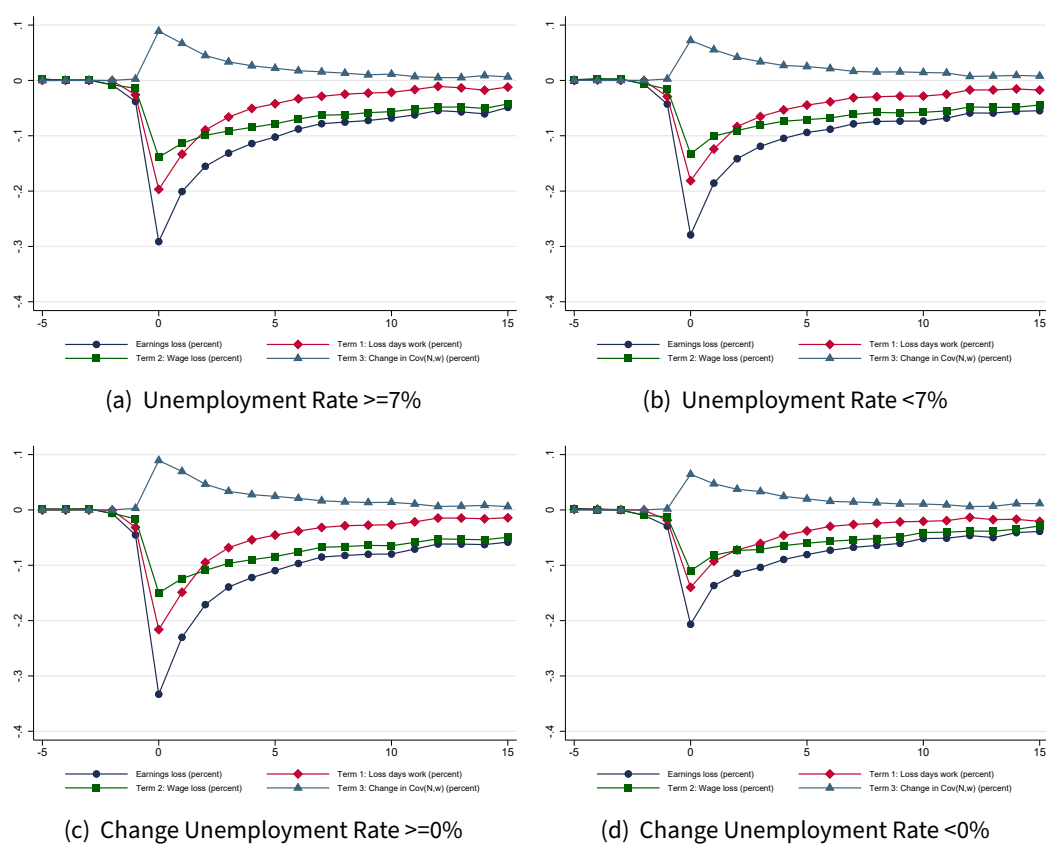
**Figure A-8: Decomposition of Earnings Loss by Year**



**Notes:** The figure decomposes 3-year earnings losses after job loss into the three components as in Figure A6 but separately by displacement year. The components are 1) the change in days worked between the displaced workers and the control group, 2) the change in wages between the two groups, and 3) the change in the covariance between the two. See Appendix Section 3 for details.

**Source:** Own calculations.

**Figure A-9: Decomposition of Earnings Loss by State of Labor Market**

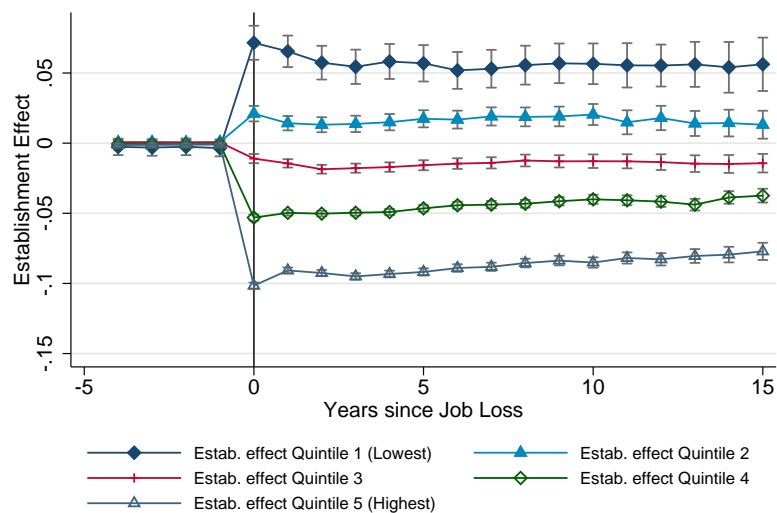


**Notes:** The figure decomposes earnings losses after job loss into the three components as in Figure A6. Panel (a) and (b) split the sample by displacement years where the unemployment rate was above or below 7 percent. Panel (c) and (d) split the sample by displacement year where the change in the unemployment rate was above or below 0. See Appendix Section 3 for details.

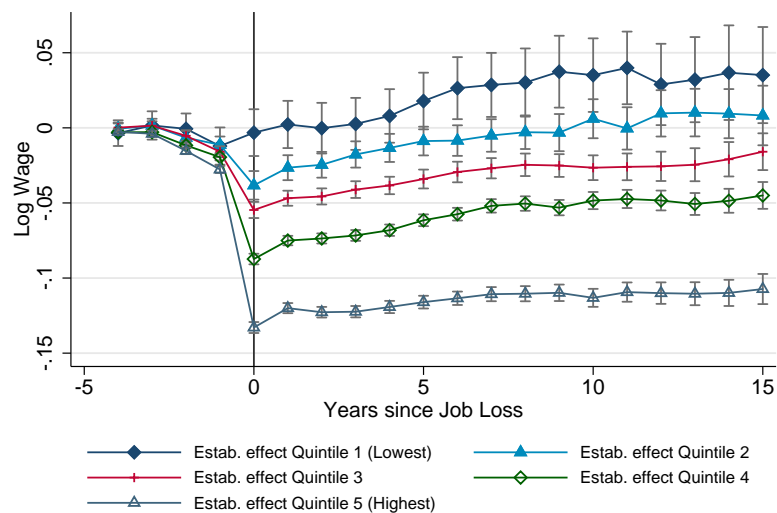
**Source:** Own calculations.



**Figure A-10: Establishment Effect and Wage Losses after Job Displacement by Quintiles of Pre-Displacement Establishment Effects (Quintiles based on Full Population)**



(a) Loss of Estab FE by Quintiles of Displacing Estab FE

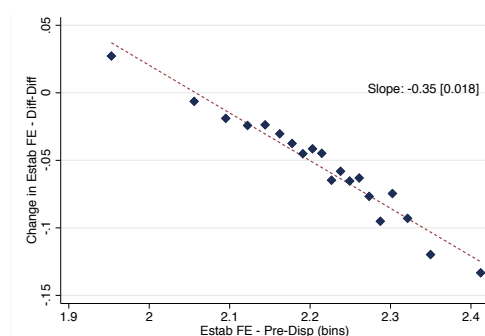


(b) Wage Loss by Quintiles Displacing Estab FE

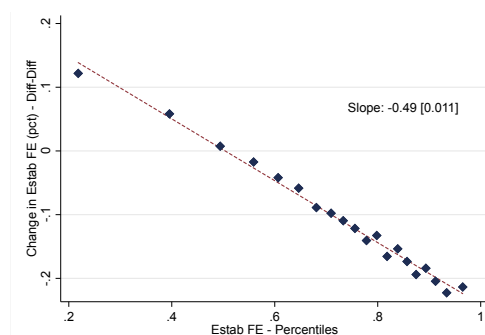
**Notes:** The figures shows the effect of jobloss on establishment effects and log wages from event study regressions (see Figure 1) separately by quintiles of the pre-displacement establishment effect. The quintiles are based on the distribution of establishment effects in the full AKM sample.

**Source:** Own calculations.

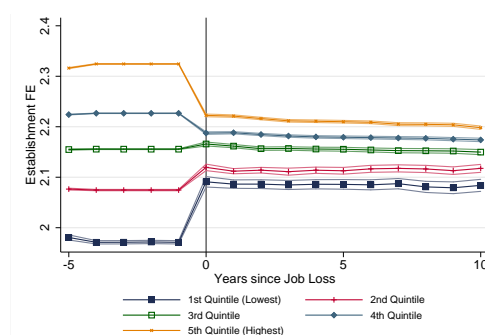
**Figure A-11: Comparing Pre- and Post-Displacement Establishment Effects**



(a) Loss of Estab FE by Pre-Disp Estab FE



(b) Change in Estab FE pctile by Pre-Disp Estab FE pctile

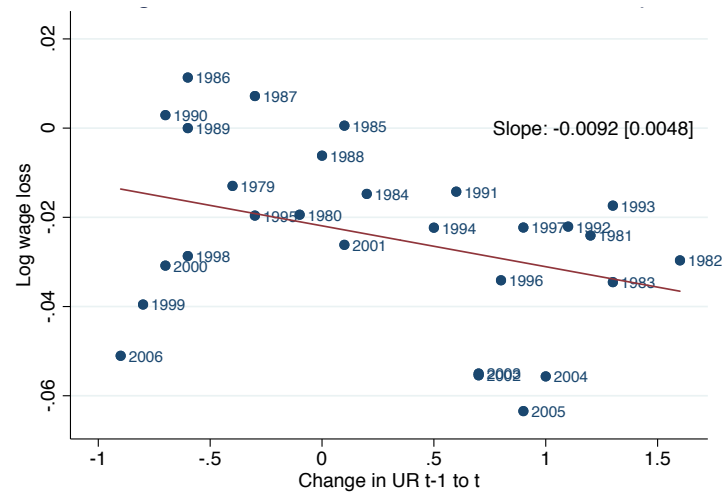


(c) Loss of Estab FE by Quintiles of Pre-Disp Estab FE

**Notes:** The figures shows the relationship between pre- and post-displacement establishment effects. Panel a) shows a binned scatter plot of the change in establishment effects by pre-displacement establishment effect. Panel b) shows the same but with establishment effects normalized to percentiles. Panel c) shows the evolution of establishment effects for displaced worker separately by quintiles of the pre-displacement establishment effect distribution (in the full population).

**Source:** Own calculations.

**Figure A-12: Effect of Job Loss on Log Daily Wages 3 Years After Displacement With Controls for Employer Characteristics**

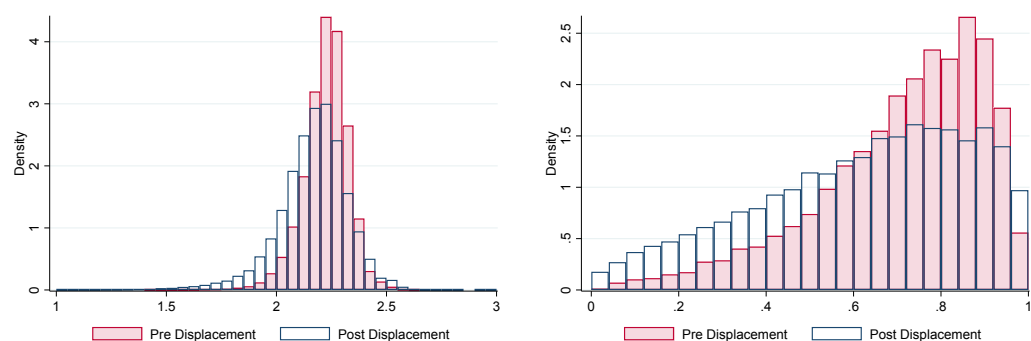


(a) By Year of Job Loss vis-a-vis Rate of Unemployment

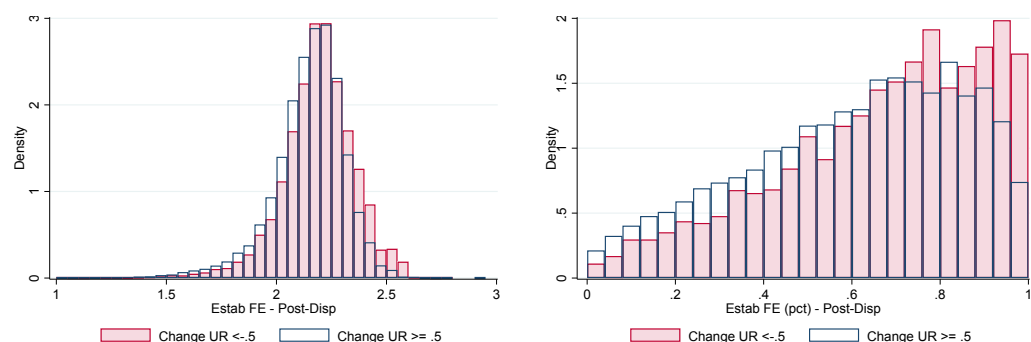
**Notes:** The figure shows the estimated year effects from a regression of the log wage loss on year dummies, the worker FE, the pre-displacement establishment FE, the change in the establishment FE (pre-post job loss) and the nonemployment duration.

**Source:** Own calculations.

**Figure A-13: The Effects of Job Loss On Distribution of Establishment Fixed Effects**



(a) Distribution of Estab FE before and after Dis- (b) Distribution of Estab FE before and after Dis-  
placement placement in Percentiles

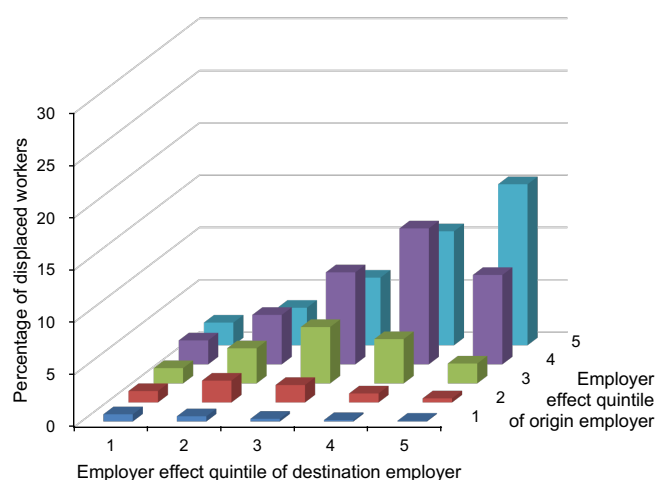


(c) Distribution of Estab FE after Displacement by (d) Distribution of Estab FE after Displacement by  
Labor Market State Labor Market State in Percentiles

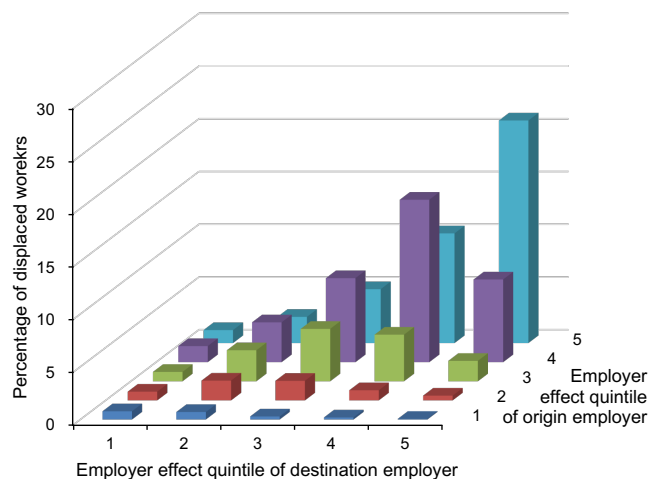
**Notes:** The figure shows the distribution of establishment effects for displaced workers. Panel (a) shows the distribution of pre- and post-displacement establishment effects. Panel (b) shows the same distributions but normalized to percentiles of the full AKM sample distribution (so that the distributions would be flat in the full distribution). Panel (c) shows the distribution of establishment effects post-displacement by state of the labor market (UR increasing by at least 0.5 percentage points or decreasing by more than -0.5 percentage points). Panel (d) shows the corresponding figure for establishment effects normalized to percentiles.

**Source:** Own calculations.

**Figure A-14: Distribution of Workers across Origin and Destination Establishment FE Quantiles by Change of Unemployment Rate**



(a) Change UR  $\geq 0$

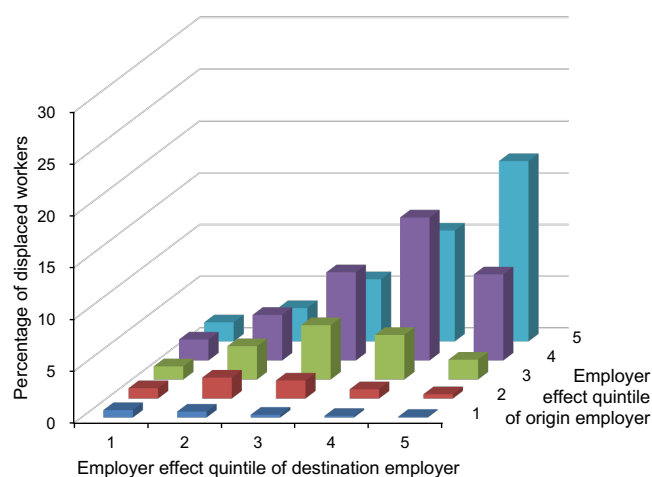


(b) Change UR  $< 0$

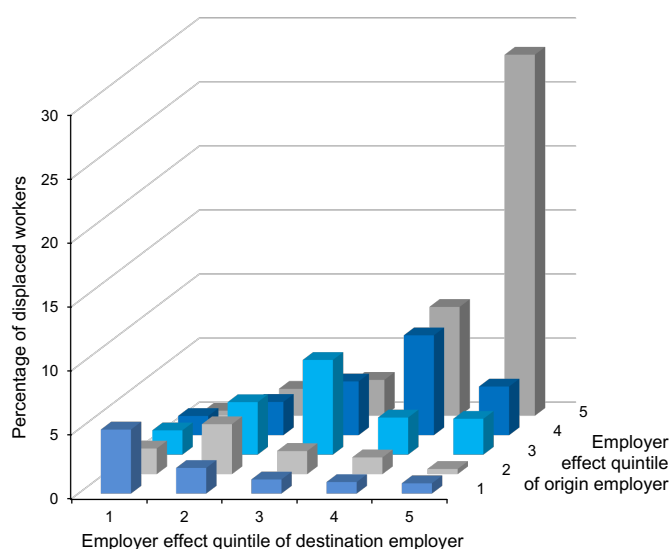
**Notes:** The figures represents a visual version of Table 3 in the paper. Each bar represents the percentage of workers in the pre- and post-displacement quintiles of the establishment effect distribution (the first row in each cell in Table 3). The top Panel corresponds to Table 3 Panel A, that is years when the unemployment rate is increasing. The bottom Panel corresponds to Table 3 Panel B, that is years when the unemployment rate is decreasing.

**Source:** Own calculations.

**Figure A-15: Distribution of Workers across Origin and Destination Establishment FE Quantiles, Comparison with Lachowska et al. (2020)**



(a) Pooling all years, Germany

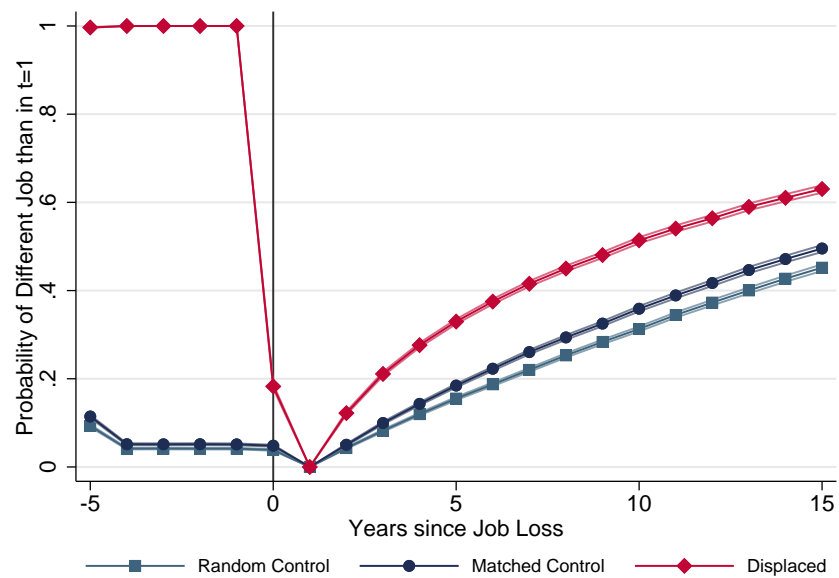


(b) Lachowska et al. (2020), Washington State

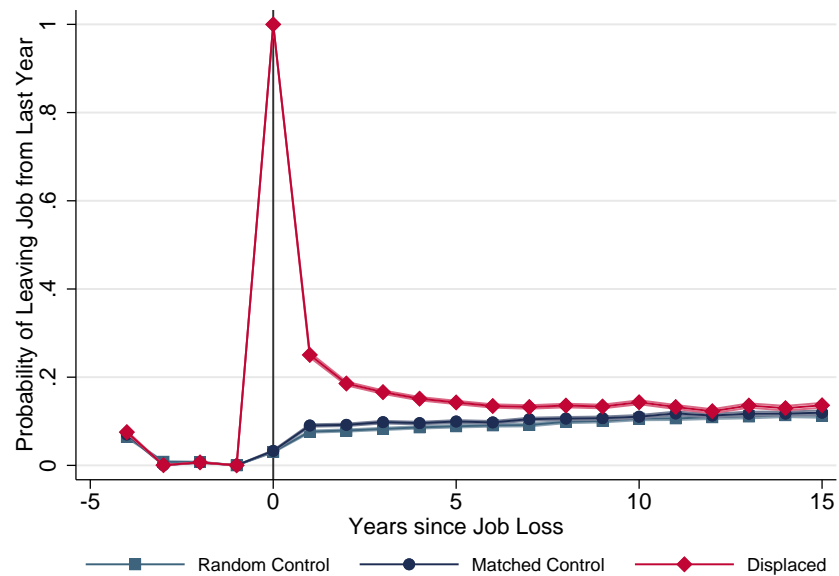
**Notes:** The figures corresponds to Table A-5 in the Appendix. Each bar represents the percentage of workers in the pre- and post-displacement quintiles of the establishment effect distribution (the first row in each cell in Table A-5). The top Panel is based on German data (Table A-5 Panel A) and pools all years. The bottom Panel is a replication of Figure 7a in Lachowska, Mas and Woodbury (2020).

**Source:** Own calculations.

**Figure A-16: Job Mobility of Displaced and Non-displaced Workers**



(a) Probability of Working in a Different Job than in t=1

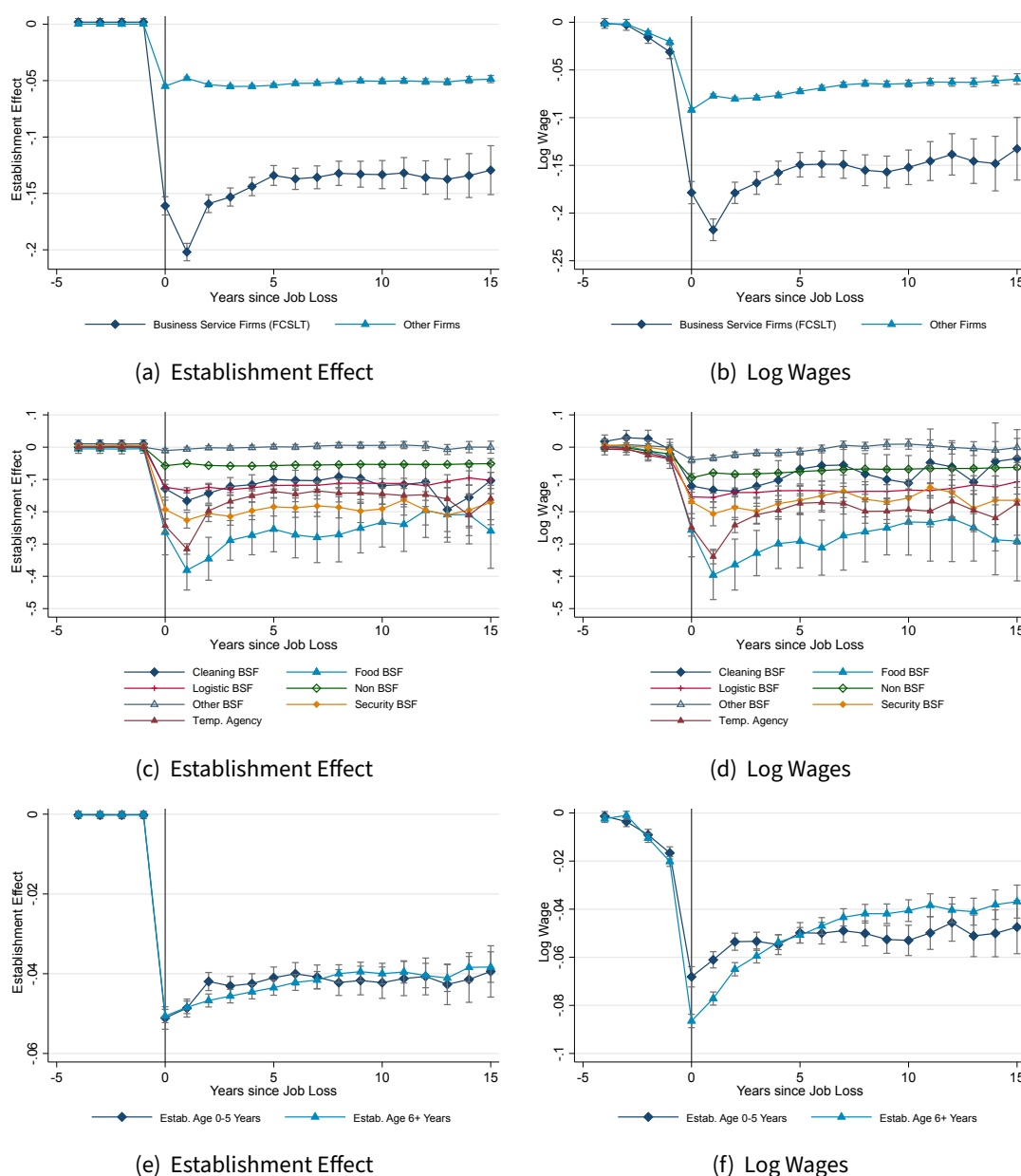


(b) Probability of Moving Job Relative to Previous Year

**Notes:** The figure shows job mobility of displaced and non-displaced workers (see Figure 1 in main text for description). The outcome in Panel (a) is a dummy for working for the same employer as the employer in t=1 (the second year after displacement). The outcome in Panel (b) is a dummy for having switched employer from the prior year.

**Source:** Own calculations.

**Figure A-17: Cost of Job Loss by Destination Industry and Destination Establishment Age**

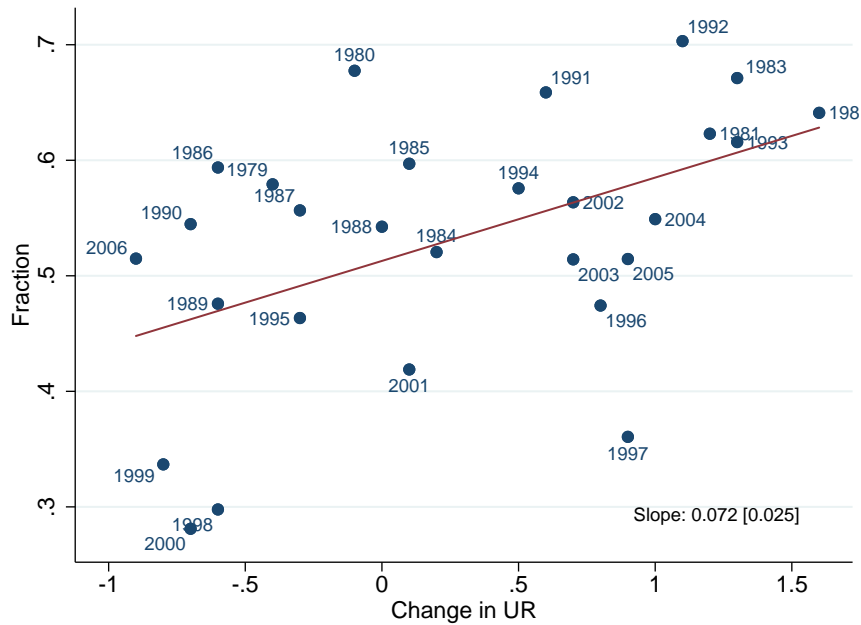


**Notes:** The figure shows event study estimates of the wage and establishment effect losses after job displacement separately by type of post-displacement establishment. Panels (a) and (b) compare workers where the post-displacement establishment is a business service firm in the Food, Cleaning, Security, Logistics, and Temp Agency sector (FCSLT) with all other outsourcing events. Panel (c) and (d) show estimates separately by more detailed industries (FCSLT, Other Business Service Firms (BSF) and non-BSF firms). Panels (e) and (f) contrast workers going to new establishments (less than 5 years old) and existing establishments.

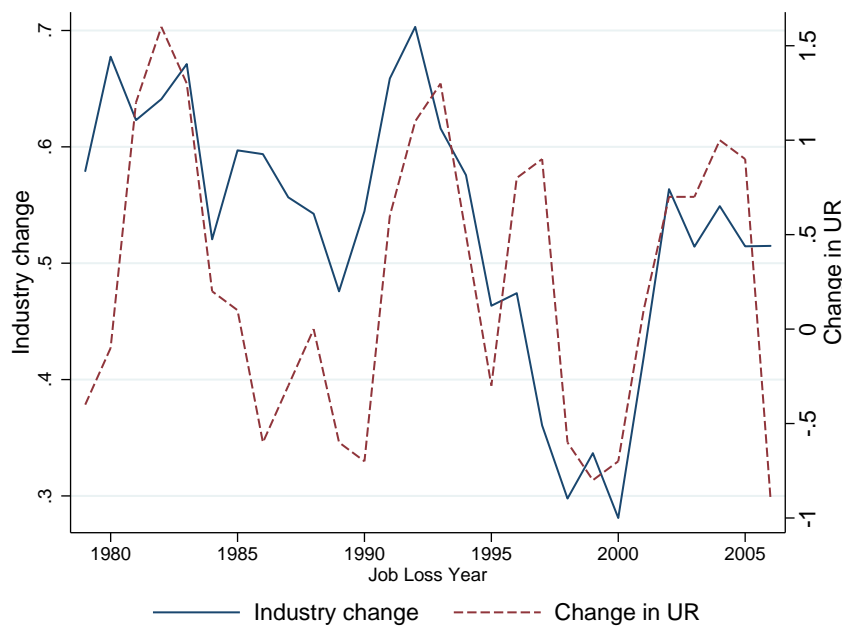
**Source:** Own calculations.



**Figure A-18: Probability of Changing 2-Digit Industry After Job Loss by Year of Job Loss**



(a) Prob. Industry Change vs Change UR

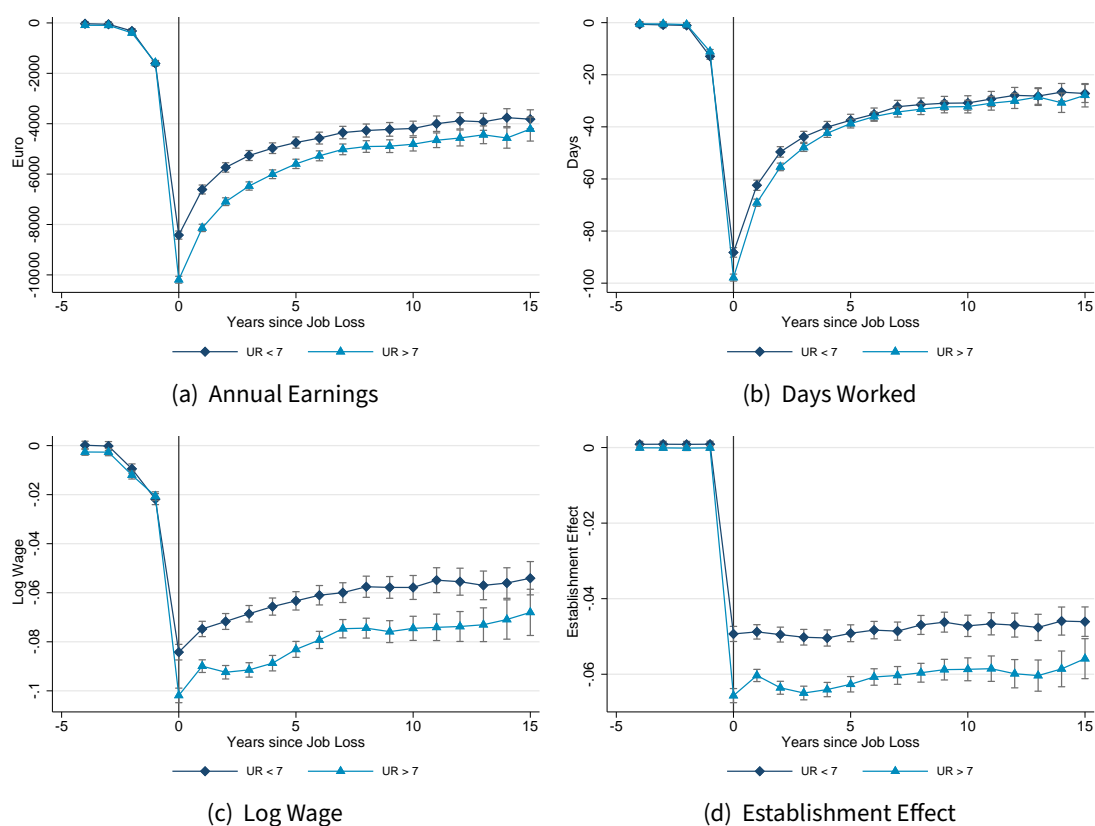


(b) Prob. Industry Change vs Change UR

**Notes:** The figures shows the share of displaced workers switching industries (3 digit) after displacement relative to their pre-displacement employer. Panel (a) shows the share as a scatter plot relative to the change in the unemployment rate in the displacement year. Panel (b) shows the share over time (alongside the unemployment rate).

**Source:** Own calculations.

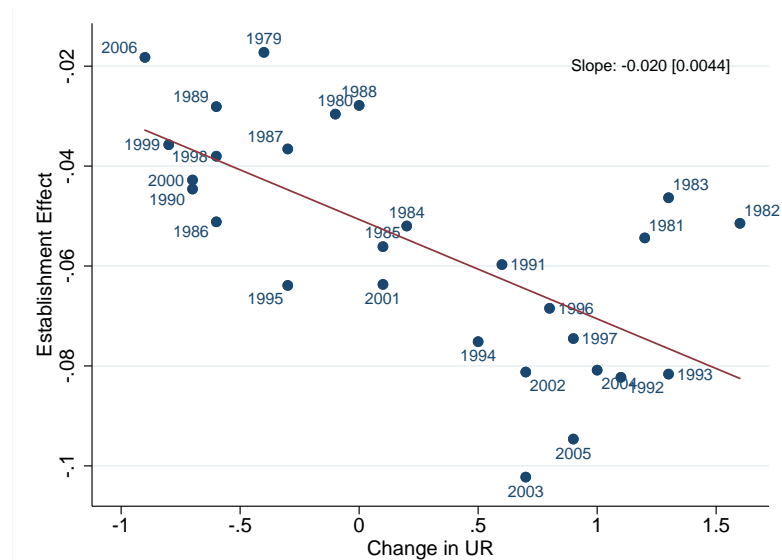
**Figure A-19: The Long Term Effects of Job Loss over the Cycle**



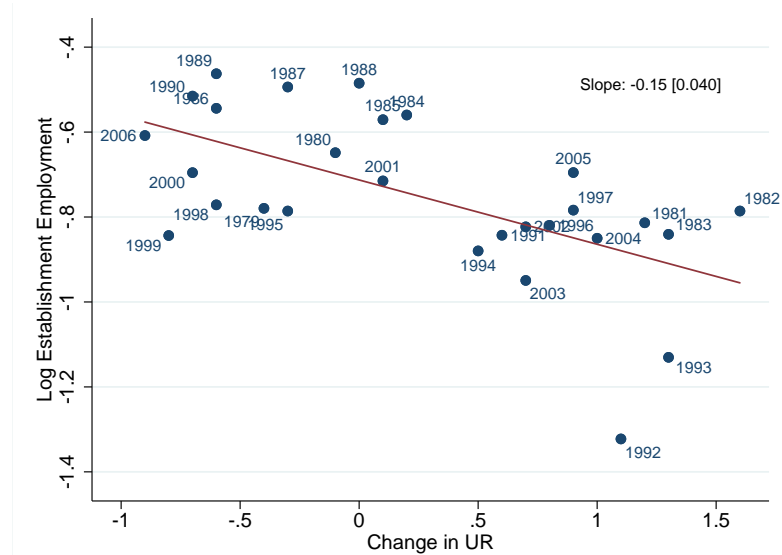
**Notes:** The figures shows event study estimates of the effects of job loss on various labor market outcomes. Each line within the figures is from a separate event study regression that uses either only observations when the unemployment rate was decreasing by at least 0.5 percentage points or increasing by at least 0.5 percentage point.

**Source:** Own calculations.

**Figure A-20: Effect of Job Loss on Employer Characteristics 3 Years After Displacement by Year of Job Loss vis-a-vis Change of Unemployment Rate at Job Loss**



(a) Establishment FE

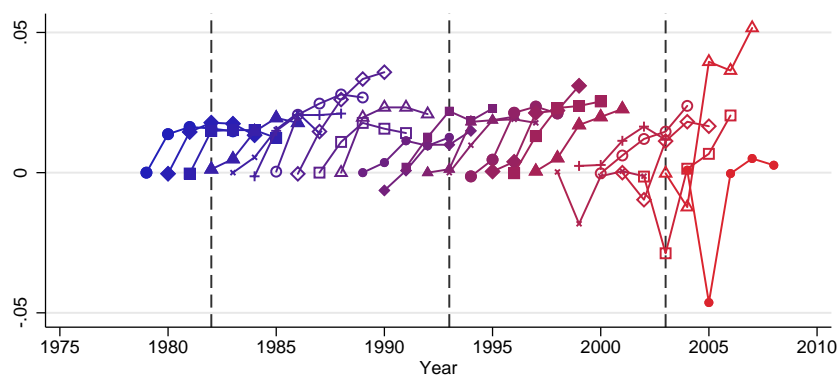


(b) Log Number of Employees at Establishment

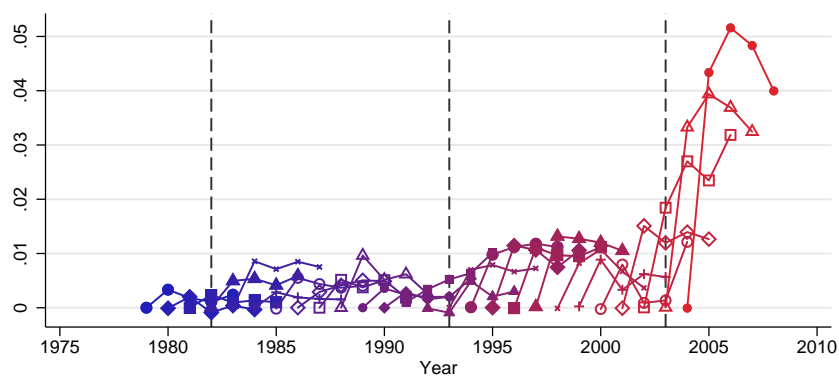
**Notes:** The figure shows scatterplots of the earnings and wage losses of job losers collapsed to the year level relative to the year over year change in the unemployment rate. The top figure shows the change in log establishment employment. The bottom figure shows the change in the establishment fixed effect. The red line shows a regression line with the indicated slope (and SE).

**Source:** Own calculations.

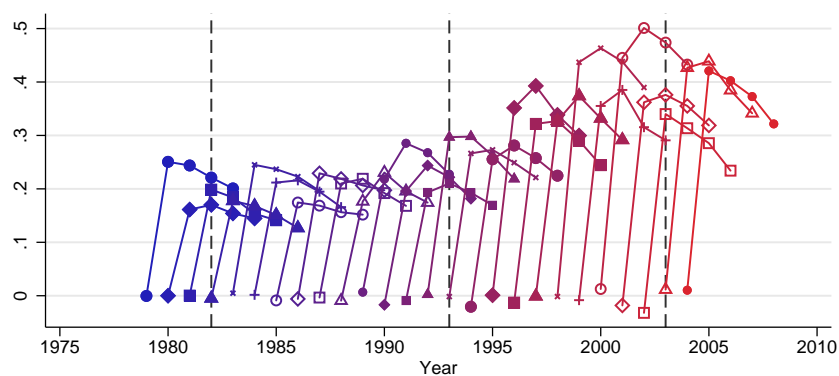
Figure A-21: Labor Market Outcomes of Displaced Workers by Year of Job Loss



(a) FCSLT Business Service Firm



(b) Temp. Agency

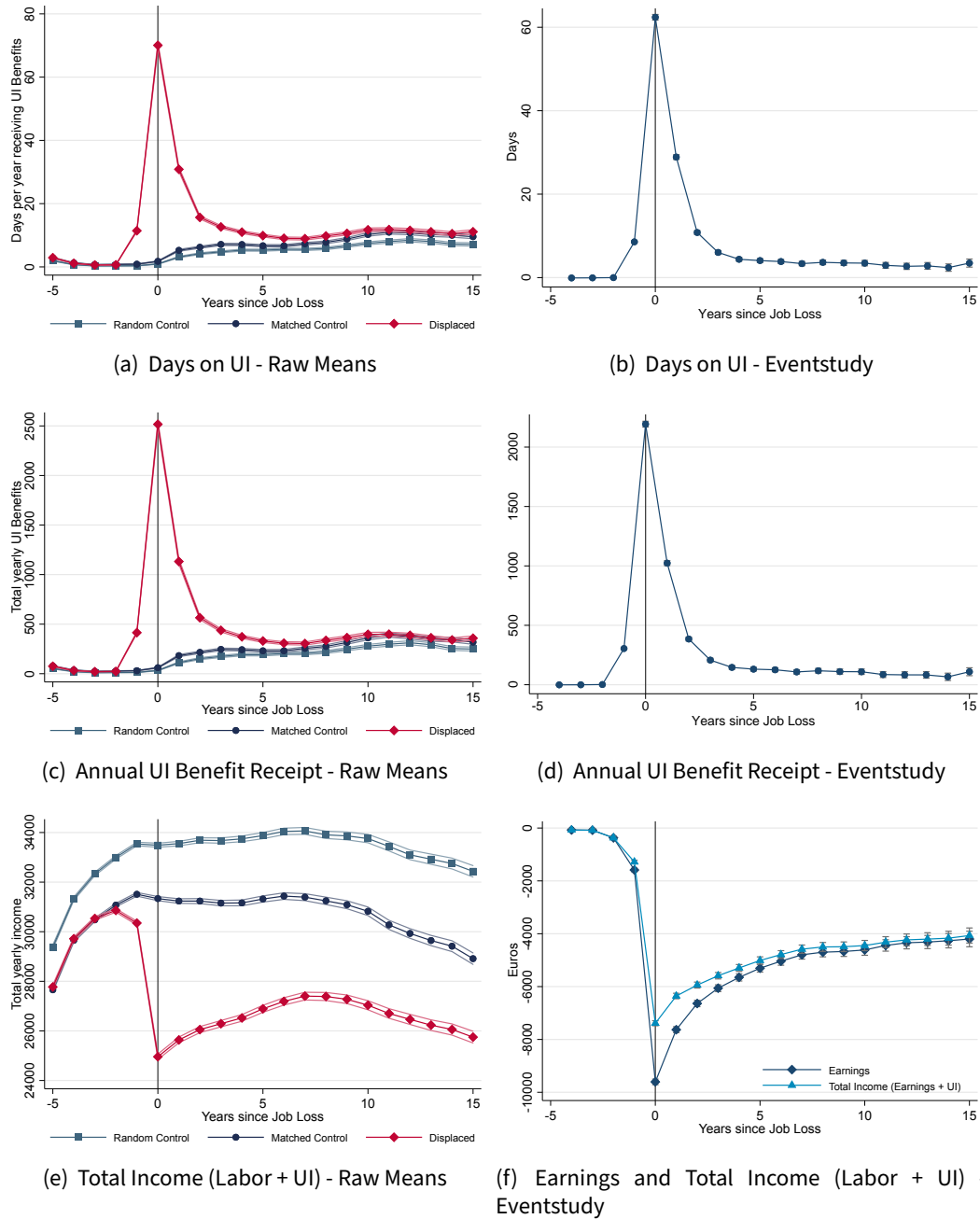


(c) Young Establishment (Age  $\leq 5$  years)

**Notes:** Lines represent the effect of being displaced on working in an FCSLT Business service firm (Panel a); a temp agency (Panel b) or a young establishment (5 years or younger). Estimated using event study regressions as in main text. Dashed vertical lines are business cycle troughs.

**Source:** Own calculations.

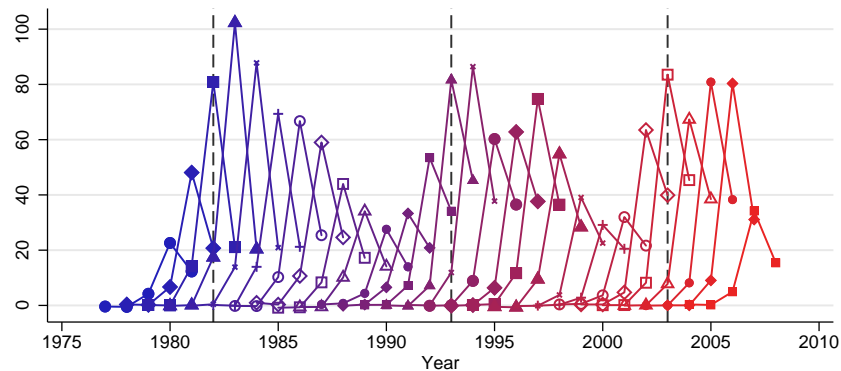
**Figure A-22: Unemployment Insurance (UI) Income and Days on UI after Job Loss**



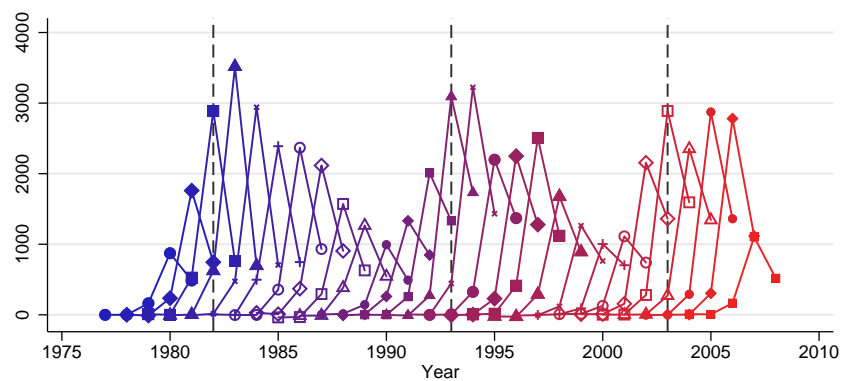
**Notes:** Panels on the left of the figure show labor market outcomes for displaced workers (red diamond line), matched non-displaced workers based on the propensity score as described in text (purple circled line), and a random sample of non-displaced workers (dark blue squared line). Each point represents the average value in the respective worker group. Panels on the right of the figure show the corresponding estimates of the effect of displacement from event study regressions. All panels are constructed pooling workers displaced between 1979 and 1994, while the outcome data spans 1975-2009. See notes to Table 1 and text for definition of sample and job displacement. Unemployment Benefits correspond to the first tier of UI benefits (ALG 1) in Germany.

**Source:** Own calculations.

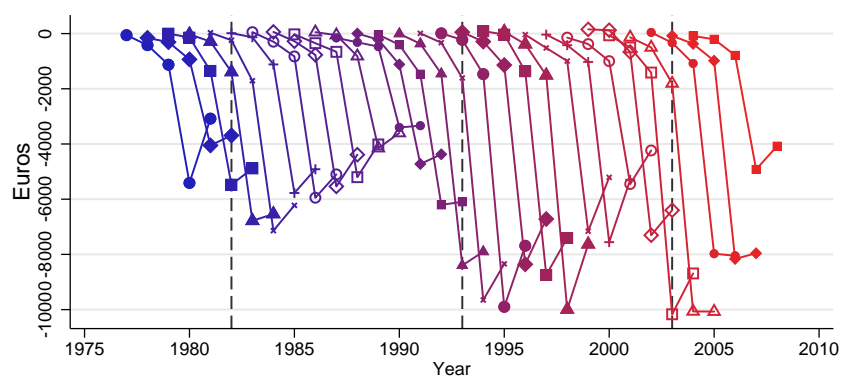
Figure A-23: Labor Market Outcomes of Displaced Workers by Year of Job Loss



(a) Days on UI



(b) Annual UI Benefits

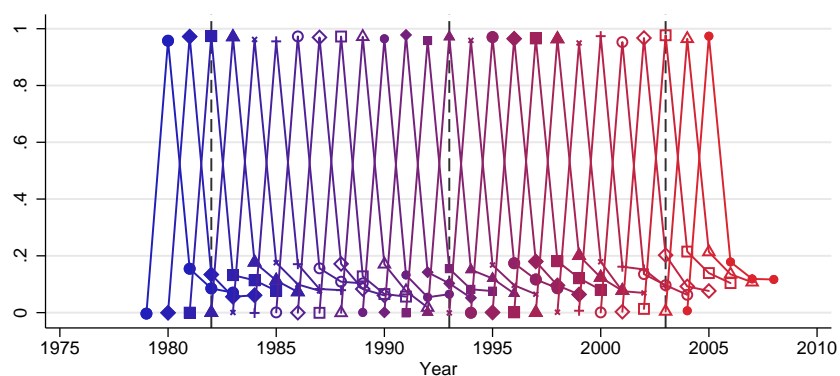


(c) Total Income (Labor Earnings + UI)

**Notes:** Lines represent the effect of being displaced on receipt of UI benefits (Panel a); Days on UI (Panel b) and Total Income (Labor Earnings plus UI receipt). UI benefits are only benefits from the first UI tier in Germany (ALG 1). Dashed vertical lines are business cycle troughs.

**Source:** Own calculations.

**Figure A-24: Job Mobility of Displaced Workers by Year of Job Loss**

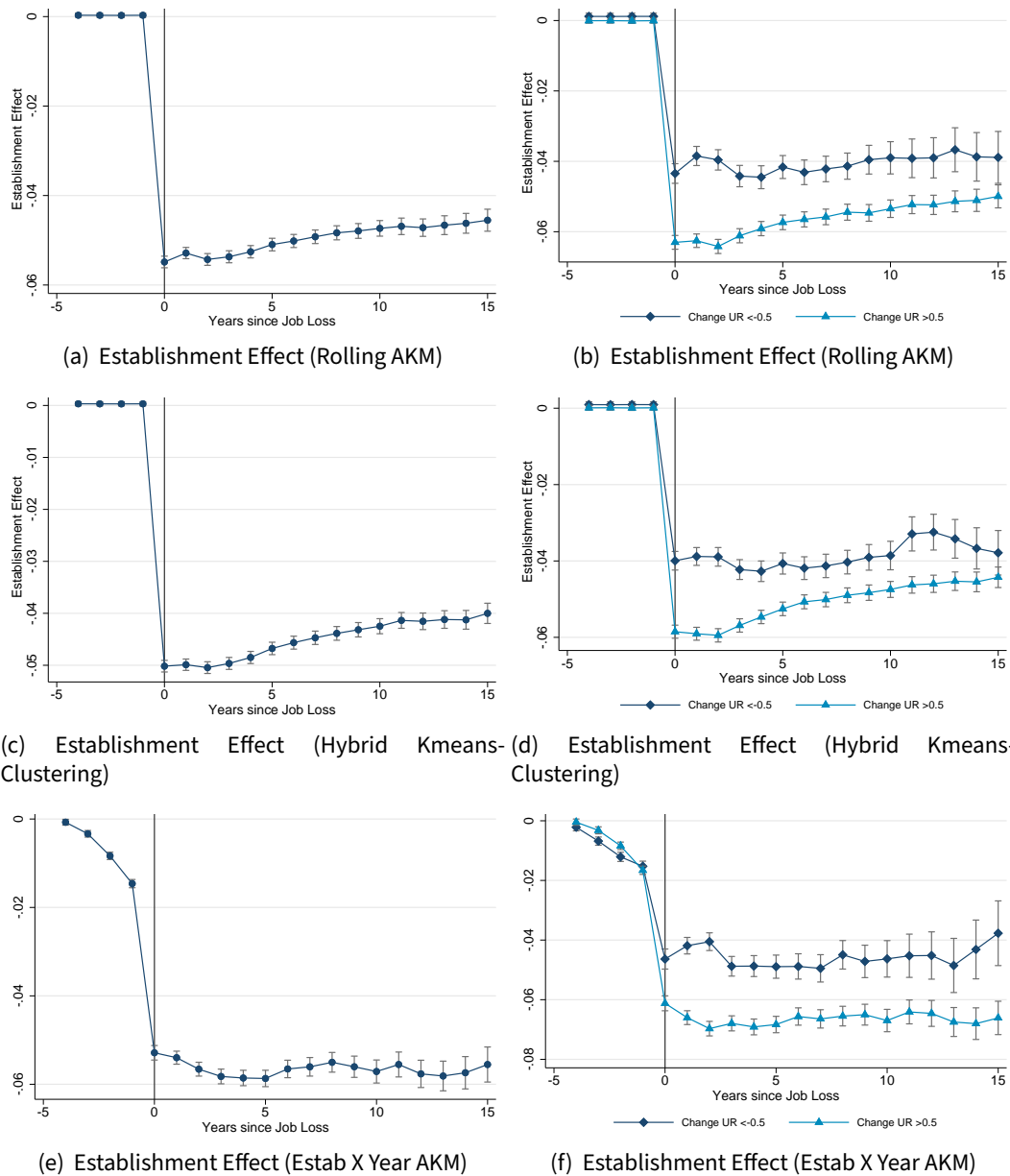


(a) Probability of Switching Job between  $t-1$  and  $t$

**Notes:** Lines represent the effect of being displaced on year over year job mobility (switching employers). Dashed vertical lines are business cycle troughs.

**Source:** Own calculations.

**Figure A-25: Post-displacement Establishment Effects of Displaced Workers - Alternative AKM Models**

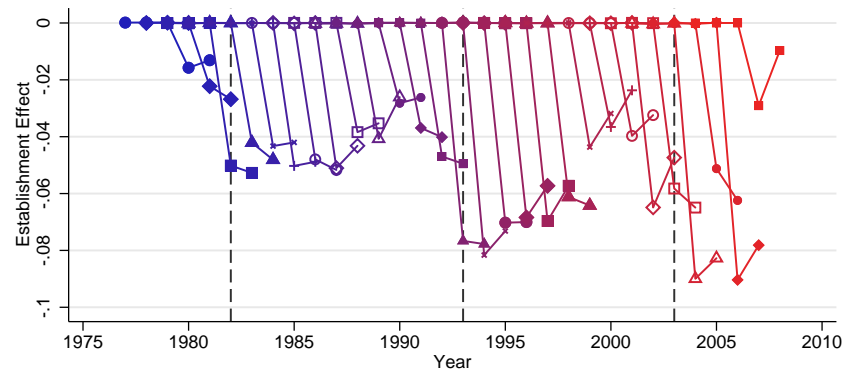


**Notes:** Lines represent the effect of being displaced on establishment effects. Panel (a) and (b) shows the rolling AKM model (pooled and by change of the unemployment rate), Panel (c) and (d) the hybrid-kmeans clustering AKM model, and Panel (e) and (f) the AKM model with flexible establishment X year effects.

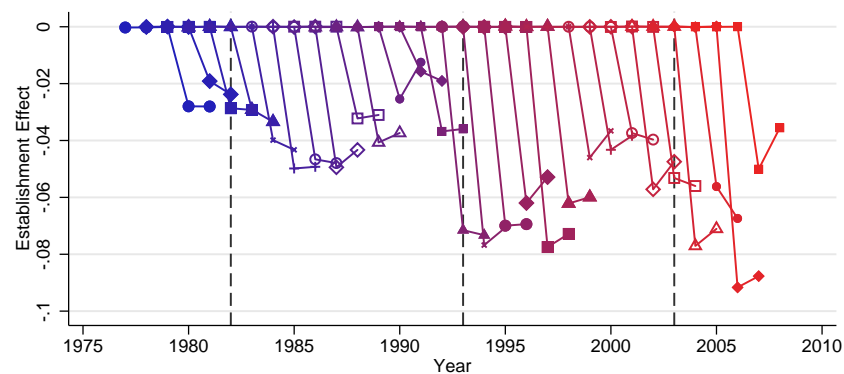
**Source:** Own calculations.



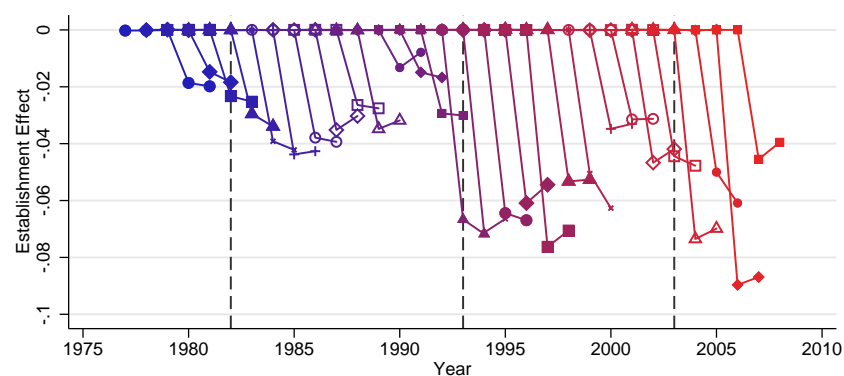
**Figure A-26: Post-displacement Establishment Effects of Displaced Workers by Year of Job Loss - Alternative AKM Models**



(a) Establishment Effect (Baseline AKM)



(b) Establishment Effect (Rolling AKM)



(c) Establishment Effect (Hybrid Kmeans-Clustering)

**Notes:** Lines represent the effect of being displaced on establishment effects. Panel (a) replicates the baseline from the main text (pooled AKM model), Panel (b) shows the rolling AKM model, Panel (c) the hybrid-kmeans clustering AKM model. Dashed vertical lines are business cycle troughs.

**Source:** Own calculations.

# 7 Results for Women

## Tables

**Table A-22: Characteristics of Displaced and Control Workers in Pre-Displacement Year - Sample: Women, West Germany**

	(1) Displaced workers	(2) Non-displaced workers matched	(3) Non-disp. workers random sample
<b>Panel A: Individual Characteristics</b>			
Non-German	0.15 [0.35]	0.11 [0.31]	0.10 [0.30]
Real wage	69.5 [25.6]	70.7 [26.1]	79.4 [25.8]
Years of education	10.6 [1.7]	10.6 [1.7]	10.7 [1.9]
Potential experience	20.5 [8.1]	20.4 [8.2]	20.0 [8.1]
Tenure with current Employer	9.08 [5.00]	9.16 [4.99]	9.48 [5.19]
Actual experience, but censored 1975	12.1 [5.9]	12.0 [5.9]	12.1 [6.0]
Total yearly earnings	24,171.3 [9,790.5]	25,617.7 [9,589.9]	28,786.3 [9,500.3]
Total yearly income	24,525.0 [9,551.3]	25,621.6 [9,587.0]	28,788.8 [9,497.6]
Days per year working fulltime	344.4 [42.6]	361.8 [17.8]	361.8 [18.2]
Wage on June 30th of year	69.5 [25.6]	70.7 [26.1]	79.4 [25.8]
Log of wage in June	4.18 [0.35]	4.19 [0.36]	4.32 [0.33]
<b>Panel B: Establishment Characteristics</b>			
Number of employees	354.6 [619.4]	362.8 [664.5]	1,738.4 [5,391.9]
Avg. years of education in estab.	10.7 [1.0]	10.7 [1.0]	11.1 [1.1]
Establishment FE	2.17 [0.12]	2.16 [0.12]	2.17 [0.13]
Business Service Firm (FCSL)	0.015 [0.121]	0.014 [0.117]	0.019 [0.138]
Temp. Agency	0.0020 [0.0446]	0.0016 [0.0396]	0.0009 [0.0297]
Business Service Firm (non-FCSLT)	0.038 [0.191]	0.037 [0.190]	0.052 [0.221]
New Establishment ( $\leq 5$ Years old)	0.050 [0.217]	0.034 [0.180]	0.027 [0.163]
Number of Observations	35,094	35,094	40,700

**Notes:** Characteristics of displaced and non-displaced workers in year prior to displacement year. Workers satisfy the following restrictions: age 24 to 50, working fulltime in pre-displacement year, have at least 3 years of tenure and establishment has at least 50 employees. Non-displaced sample of workers in Column (2) are matched to displaced workers using propensity score matching within year and industry cells. Non-displaced sample of workers in Column (3) is a random sample of workers (one per displaced worker, including workers for whom no match could be found in Column (1) that satisfy the same baseline restrictions. Standard deviations of variables are in brackets.

**Source:** Own calculations.

**Table A-23: Characteristics of Displaced and Control Workers in Pre-Displacement Year  
- Sample: Women, West Germany**

	(1) Displaced workers	(2) Non-displaced workers matched	(3) Non-disp. workers random sample
<b>Panel C: Industry (percent)</b>			
A Agriculture, fishing, hunting and forestry	0 [0]	0 [0]	0 [3]
C Manufacturing	66.0 [47.4]	66.0 [47.4]	40.7 [49.1]
D Energy supply	0.3 [5.8]	0.3 [5.8]	1.0 [9.8]
E Water supply and other utilities	0.003 [0.534]	0.003 [0.534]	0.231 [4.801]
F Construction	1.3 [11.3]	1.3 [11.3]	1.1 [10.6]
G Wholesale and retail trade, Vehicle repair	15.4 [36.1]	15.4 [36.1]	11.2 [31.6]
H Transport and storage	1.7 [12.8]	1.7 [12.8]	3.0 [17.1]
I Hotels and restaurants	0.07 [2.72]	0.07 [2.72]	0.64 [7.98]
J Information and communication	2.3 [14.8]	2.3 [14.8]	2.5 [15.6]
K Financial and insurance services	4.0 [19.7]	4.0 [19.7]	10.2 [30.2]
L Real estate, renting and business activities	0.07 [2.61]	0.07 [2.61]	0.46 [6.80]
M Personal, technical and scientific services	1.8 [13.2]	1.8 [13.2]	3.0 [17.2]
N Other business services	0.8 [9.1]	0.8 [9.1]	1.1 [10.3]
P Education	0.5 [7.3]	0.5 [7.3]	2.2 [14.5]
Q Health and social work	3.5 [18.3]	3.5 [18.3]	19.4 [39.5]
R Arts and recreation	0.009 [0.925]	0.009 [0.925]	0.676 [8.194]
S Other services	2.3 [14.9]	2.3 [14.9]	2.6 [15.9]
Number of Observations	35,094	35,094	40,700

**Notes:** Characteristics of displaced and non-displaced workers in year prior to displacement year. Workers satisfy the following restrictions: age 24 to 50, working fulltime in pre-displacement year, have at least 3 years of tenure and establishment has at least 50 employees. Non-displaced sample of workers in Column (2) are matched to displaced workers using propensity score matching within year and industry cells. Non-displaced sample of workers in Column (3) is a random sample of workers (one per displaced worker, including workers for whom no match could be found in Column (1) that satisfy the same baseline restrictions. Standard deviations of variables are in brackets.

**Source:** Own calculations.

**Table A-24: Effect of Unemployment Rate on Outcomes for Job Losers over 3 years after Job Displacement - Sample: Women, West Germany**

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A: Regression of Effect of Job Loss on Year over Year Change in National Unemployment Rate</b>						
	Estimated Effect of Change in UR		Predicted Effect of Change in UR		Difference going from -1% to +1% Change UR	Mean of dependent variable
Outcome:	Coefficient	Std. Err.	$\Delta UR = -1\%$	$\Delta UR = +1\%$		
Annual Earnings (in Euro)	-1732.3	[301.0]	-4415.2	-7879.8	-3464.6	-6580.6
Annual Earnings (Log points)	-0.079	[0.013]	-0.19	-0.35	-0.16	-0.29
Log Wage Change	-0.039	[0.0072]	-0.059	-0.14	-0.081	-0.11
Annual Days Worked	-22.9	[3.86]	-57.6	-103.4	-45.8	-86.3
Estab FE	-0.017	[0.0037]	-0.021	-0.055	-0.034	-0.042
Annual Income (in Euro)	-1560.2	[290.1]	-3626	-6746.4	-3120.4	-5576.3
Annual UI Receipt (in Euro)	172.1	[43.4]	789.1	1133.3	344.2	1004.3
Log Establishment Size	-0.13	[0.033]	-0.65	-0.91	-0.26	-0.82
Business Service Firm (FCSL)	0.0037	[0.0035]	0.020	0.028	0.0080	0.025
Temp. Agency	0.0015	[0.0045]	0.011	0.015	0.0040	0.013
Business Service Firm (non-FCSLT)	0.0016	[0.0047]	0.054	0.058	0.0040	0.057
New Establishment ( $\leq 5$ Years old)	-0.025	[0.024]	0.29	0.24	-0.050	0.26
<b>Panel B: Regression of Effect of Job Loss on National Unemployment Rate</b>						
	Estimated Effect of Unemployment Rate		Predicted Effect of Unemployment Rate		Difference going from 4% to 9% UR	Mean of dependent variable
Outcome:	Coefficient	Std. Err.	UR=4%	UR=9%		
Annual Earnings (in Euro)	-229.3	[154.3]	-5815	-6961.5	-1146.5	-6580.6
Annual Earnings (Log points)	0.0062	[0.0070]	-0.31	-0.27	0.040	-0.29
Log Wage Change	-0.0053	[0.0036]	-0.090	-0.12	-0.030	-0.11
Annual Days Worked	2.29	[2.05]	-93.9	-82.5	11.4	-86.3
Estab FE	-0.0018	[0.0017]	-0.036	-0.045	-0.0090	-0.042
Annual Income (in Euro)	-251.3	[140.9]	-4737.2	-5993.7	-1256.5	-5576.3
Annual UI Receipt (in Euro)	-22.0	[19.0]	1077.8	967.8	-110	1004.3
Log Establishment Size	-0.017	[0.014]	-0.76	-0.84	-0.080	-0.82
Business Service Firm (FCSL)	-0.0038	[0.0010]	0.038	0.019	-0.019	0.025
Temp. Agency	0.0054	[0.0012]	-0.0054	0.022	0.027	0.013
Business Service Firm (non-FCSLT)	0.0038	[0.0015]	0.044	0.063	0.019	0.057
New Establishment ( $\leq 5$ Years old)	0.033	[0.0059]	0.16	0.32	0.16	0.26

**Notes:** Each row represents a separate regression of the mean losses in the outcome variable over a three year period after job loss on the national unemployment rate (Panel A), and the year over year change in the national unemployment rate (Panel B). The model is estimated on the yearly level.

**Source:** Own calculations.

**Table A-25: The Cyclicity of Log Wage Losses With and Without Controlling for Changes in Establishment Effects - Sample: Women, West Germany**

	(1) log wage	(2) log wage	(3) log wage	(4) log wage	(5) log wage	(6) log wage
<b>Panel A: Medium-run wage losses (0-3 Year Post Displacement)</b>						
Change in UR t-1 to t	-0.039 (0.0058)**	-0.038 (0.0061)**	-0.026 (0.0050)**	-0.020 (0.0048)**	-0.024 (0.0047)**	-0.018 (0.0046)**
Establishment FE		-0.17 (0.048)**			0.077 (0.030)*	0.20 (0.037)**
Worker effect		0.22 (0.014)**			0.13 (0.015)**	0.083 (0.015)**
Change in Estab FE			0.69 (0.024)**	1	0.68 (0.023)**	1
Mean of dep. var	-0.10	-0.10		-0.10	-0.10	-0.10
R <sup>2</sup>	0.0078	0.057	0.16	0.020	0.16	0.029
N	24702	24702	24702	24702	24702	24702
<b>Panel B: Long-run wage losses (0-10 Year Post Displacement)</b>						
Change in UR t-1 to t	-0.027 (0.0059)**	-0.024 (0.0063)**	-0.017 (0.0058)**	-0.014 (0.0057)*	-0.016 (0.0058)*	-0.014 (0.0059)*
Establishment FE		-0.25 (0.047)**			0.15 (0.043)**	0.27 (0.047)**
Worker effect		0.29 (0.018)**			0.18 (0.018)**	0.15 (0.018)**
Change in Estab FE			0.79 (0.027)**	1	0.77 (0.027)**	1
Mean of dep. var	-0.066	-0.066	-0.066	-0.066	-0.066	-0.066
R <sup>2</sup>	0.011	0.12	0.36	0.055	0.37	0.064
N	61227	61227	61227	61227	61227	61227

**Notes:** The sample is men with at least 3 years of tenure employed at an establishment of size greater or equal 50 displaced between 1980 and 2005 (see text for a definition of displacement). The dependent variables is the wage loss 3 years post displacement. Regressions control for year and year squared. The change in the unemployment rate is measured in percentage points and is the unemployment rate for West Germany. Columns (4) and (6) regresses the log wage loss on the unemployment rate (change in UR) controlling for the change in the establishment effect, where the coefficient on the establishment effect is forced to be equal to 1. All regressions control for a quadratic in the calendar year; regressions in columns (2) to (6) also control for a quadratic in years of job tenure at displacement and a quadratic in years of potential labor market experience. Statistical significance: \* indicates  $p \leq 0.05$  and \*\* indicates  $p \leq 0.01$ , SE are clustered on year level.

**Source:** Own calculations.

Table A-26: The Cyclicalities of Log Wage Losses Up to 3 Years After Job Loss Controlling for Individual Characteristics - Sample: Women, West Germany

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	log wage	log wage	log wage	log wage	log wage	log wage	log wage	log wage	log wage
Change in UR t-1 to t	-0.038 (0.0061)**	-0.024 (0.0047)**	-0.028 (0.0053)**	-0.018 (0.0045)**	-0.023 (0.0049)**	-0.018 (0.0046)**	-0.022 (0.0046)**	-0.022 (0.0054)**	-0.015 (0.0046)**
Establishment FE	-0.17 (0.048)**	0.077 (0.030)*	-0.16 (0.044)**	0.074 (0.029)*	0.085 (0.032)*	0.064 (0.028)*	0.046 (0.029)	-0.14 (0.049)**	0.024 (0.030)
Change in Estab FE		0.68 (0.023)**		0.63 (0.024)**	0.62 (0.020)**	0.57 (0.022)**	0.66 (0.024)**		0.51 (0.022)**
Worker FE	0.22 (0.014)**	0.13 (0.015)**	0.16 (0.014)**	0.088 (0.015)**	0.082 (0.016)**	0.082 (0.015)**	0.084 (0.015)**	0.062 (0.016)**	0.021 (0.016)
Nonemp. Duration (post Disp)			-0.12 (0.012)**	-0.094 (0.0095)**				-0.074 (0.0089)**	-0.062 (0.0075)**
Occ. change					-0.067 (0.0074)**			-0.012 (0.0072)	-0.0022 (0.0070)
Ind. change					-0.049 (0.0068)**			-0.0016 (0.0067)	-0.0029 (0.0058)
Change in Industry Tenure						0.0083 (0.00049)**		0.0069 (0.000358)**	0.0052 (0.00052)**
Change in Occupation Tenure						0.0074 (0.00060)**		0.0062 (0.00068)**	0.0056 (0.00060)**
Parttime - Diff-Diff							-0.35 (0.0076)**	-0.34 (0.0079)**	-0.34 (0.0074)**
Business Service Firm (FCSL)								-0.14 (0.021)**	-0.099 (0.021)**
Temp. Agency								-0.22 (0.044)**	-0.080 (0.030)*
Business Service Firm (Non-FCSLT)								-0.014 (0.0100)	-0.0082 (0.0096)
New Establishment								-0.0070 (0.0069)	-0.0026 (0.0042)
Pre-disp Tenure	-0.012 (0.0022)**	-0.011 (0.0021)**	-0.012 (0.0022)**	-0.011 (0.0021)**	-0.012 (0.0022)**	-0.0056 (0.0019)**	-0.012 (0.0022)**	-0.0087 (0.0022)**	-0.0088 (0.0021)**
Tenure squared	0.00026 (0.000077)**	0.00022 (0.000073)**	0.00027 (0.000079)**	0.00022 (0.000074)**	0.00025 (0.000079)**	0.00018 (0.000070)*	0.00027 (0.000079)**	0.00029 (0.000082)**	0.00027 (0.000079)**
Potential experience	-0.0091 (0.0017)**	-0.0081 (0.0014)**	-0.0087 (0.0017)**	-0.0079 (0.0014)**	-0.0081 (0.0017)**	-0.0071 (0.0015)**	-0.0073 (0.0014)**	-0.0067 (0.0018)**	-0.0067 (0.0015)**
Experience squared	0.00013 (0.000042)**	0.00013 (0.000036)**	0.00014 (0.000041)**	0.00014 (0.000036)**	0.00013 (0.000042)**	0.00012 (0.000038)**	0.00011 (0.000033)**	0.00012 (0.000043)**	0.00012 (0.000038)**
Change in Estab FE coef = 1	0	0	0	0	0	0	0	0	0
Mean of dep. var	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10
R <sup>2</sup>	0.057	0.16	0.096	0.19	0.17	0.21	0.26	0.24	0.30
N	24702	24702	24702	24702	21272	24702	24702	21272	21272

**Notes:** See notes to Table 4 for basic variable definitions and controls. In addition: Nonemp. Duration is the duration in months of the first nonemployment spell after job loss. Occ. change is an indicator for switching 2 digit occupation after job loss. Ind. change an indicator for switching 3 digit industry. Change in industry and occupation tenure is the change in occ/ind tenure at the current job, based on 2 digit occupation and 3 digit industry codes. Parttime is an indicator for working parttime (less than 30 hours per week). FCSL is an indicator variable for working at a Food, Cleaning, Security or Logistics firm. Temp. Agency is an indicator for working at a temporary help agency. Business Service Firm (Non-FCSLT) is an indicator for working in the business service sector except for FCSL or a temp. agency. New Establishments are establishments less than 5 years old. Statistical significance: \* indicates  $p \leq 0.05$  and \*\* indicates  $p \leq 0.01$ , SE are clustered on year level.

**Source:** Own calculations.

**Table A-27: The Cyclicalities of Log Wage Losses with and without Controlling for Establishment Effects - High vs. Low Worker FE Sample - Sample: Women, West Germany**

	(1) log wage	(2) log wage	(3) log wage	(4) log wage	(5) log wage	(6) log wage
<b>Panel A: High Worker FE (above median)</b>						
Change in UR t-1 to t	-0.030 (0.0066)**	-0.031 (0.0068)**	-0.020 (0.0059)**	-0.012 (0.0056)*	-0.020 (0.0058)**	-0.010 (0.0053)
Establishment FE		-0.084 (0.027)**			0.072 (0.023)**	0.20 (0.039)**
Worker effect		0.13 (0.017)**			0.071 (0.013)**	0.024 (0.014)
Change in Estab FE			0.55 (0.028)**		0.56 (0.027)**	
Mean of dep. var	-0.043	-0.043		-0.043	-0.043	-0.043
R <sup>2</sup>	0.047	0.054	0.13	0.039	0.13	0.046
N	10644	10644	10644	10644	10644	10644
<b>Panel B: Low Worker FE (below median)</b>						
Change in UR t-1 to t	-0.040 (0.0073)**	-0.041 (0.0075)**	-0.028 (0.0060)**	-0.024 (0.0059)**	-0.028 (0.0059)**	-0.024 (0.0057)**
Establishment FE		-0.29 (0.075)**			0.076 (0.058)	0.20 (0.055)**
Worker effect		0.19 (0.045)**			0.12 (0.048)*	0.091 (0.048)
Change in Estab FE			0.74 (0.033)**		0.75 (0.035)**	
Mean of dep. var	-0.15	-0.15		-0.15	-0.15	-0.15
R <sup>2</sup>	0.023	0.033	0.16	0.0097	0.16	0.014
N	14058	14058	14058	14058	14058	14058

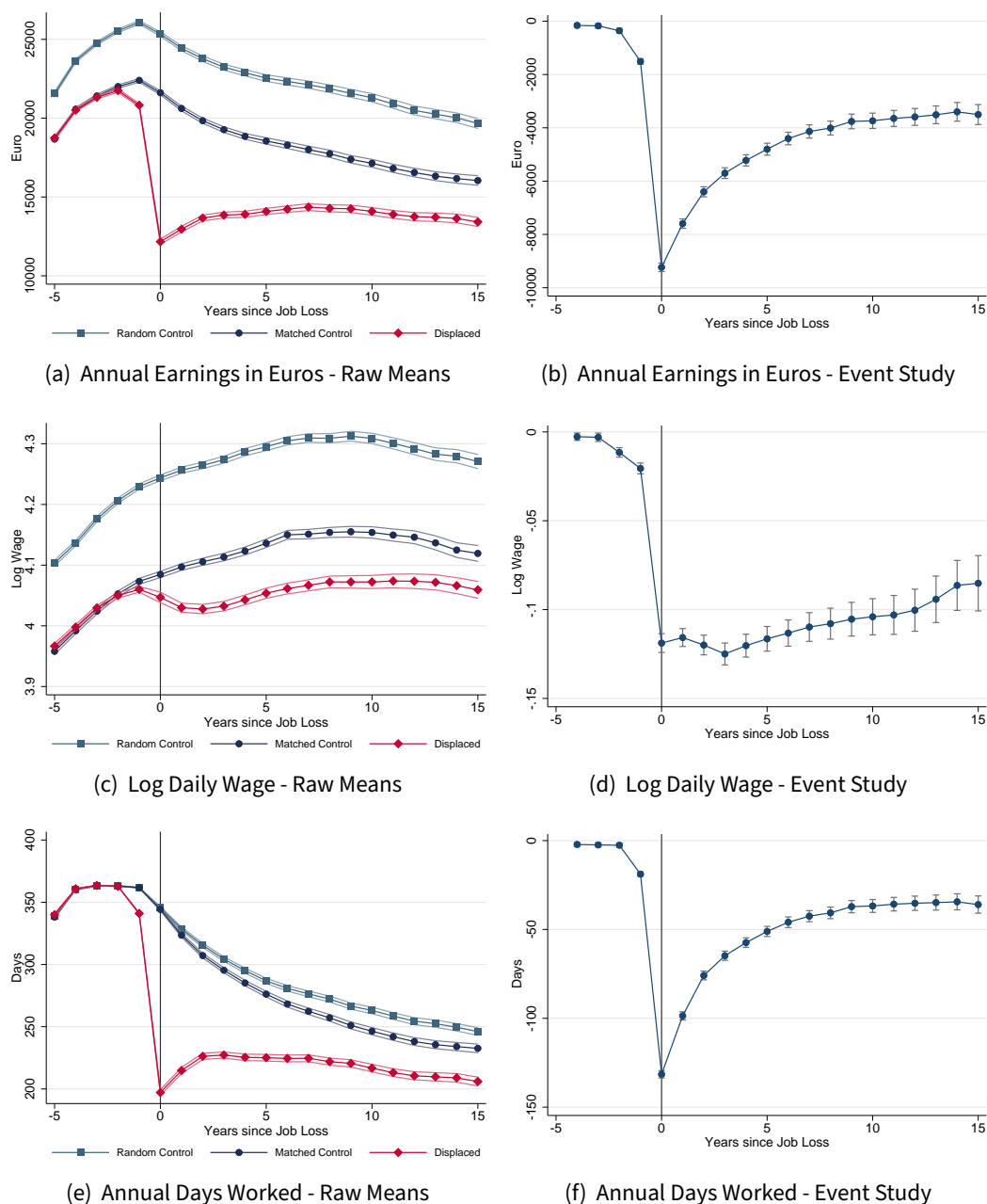
**Notes:** See Table 4 for variable definitions and additional controls. The change in the unemployment rate is measured in percentage points and is the unemployment rate for West Germany. Columns (5) and (6) regresses the log wage loss on the change in UR controlling for the change in the establishment effect, where the coefficient on the establishment effect is forced to be equal to 1. Panel A. restricts to workers whose worker fixed effect is above the median in the full population of workers in the AKM model. Panel B restricts to workers whose worker fixed effect is below the median. Statistical significance: \* indicates  $p \leq 0.05$  and \*\* indicates  $p \leq 0.01$ , SE are clustered on year level.

**Source:** Own calculations.



## Figures

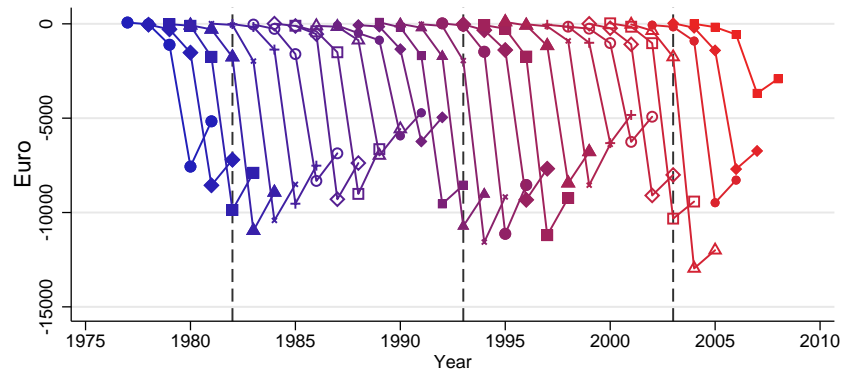
**Figure A-27: Labor Market Outcomes of Displaced Workers before and after Job Loss - Sample: Women, West Germany**



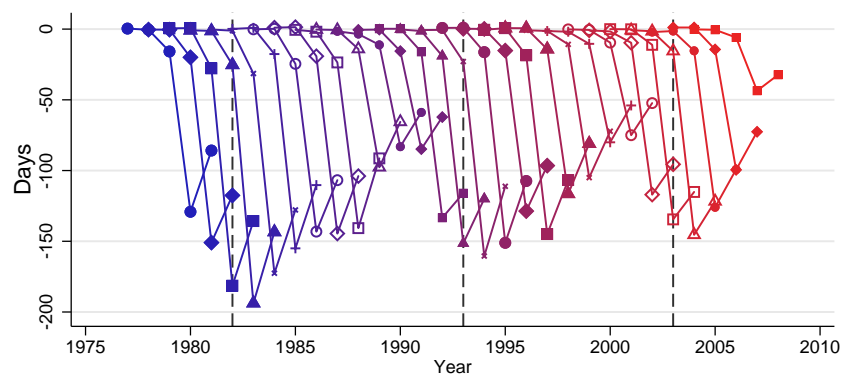
**Notes:** Panels on the left of the figure show labor market outcomes for displaced workers (red diamond line), matched non-displaced workers based on the propensity score as described in text (purple circled line), and a random sample of non-displaced workers (dark blue squared line). Each point represents the average value in the respective worker group. Panels on the right of the figure show the corresponding estimates of the effect of displacement from event study regressions. All panels are constructed pooling workers displaced between 1979 and 1994, while the outcome data spans 1975-2009. See notes to Table 1 and text for definition of sample and job displacement.

**Source:** Own calculations.

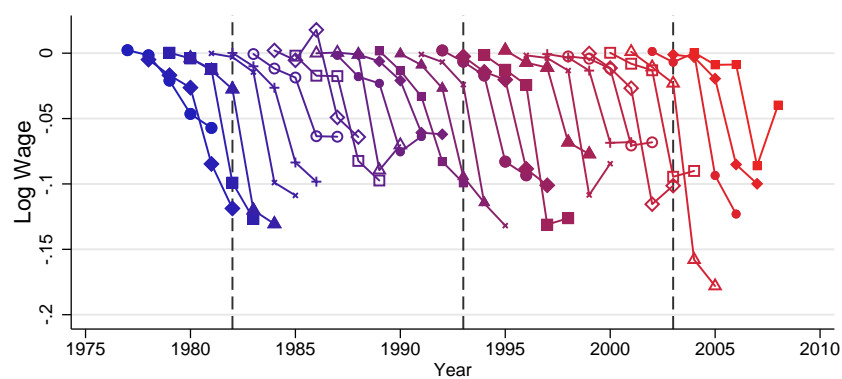
**Figure A-28: Labor Market Outcomes of Displaced Workers by Year of Job Loss - Sample: Women, West Germany**



(a) Losses in Annual Earnings by Year in Euros



(b) Losses in Annual Days Worked by Year

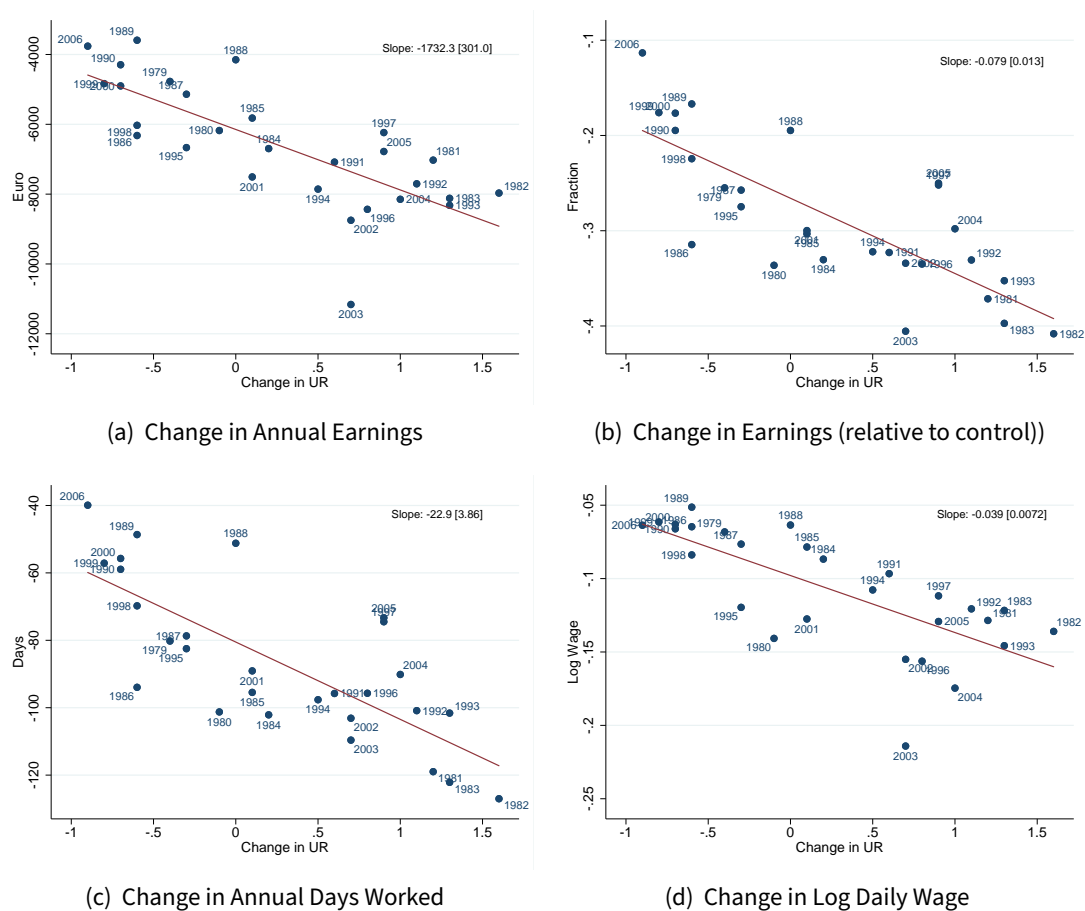


(c) Log Wage Losses by Year

**Notes:** Each line plots the coefficients from a separate event study regression estimating the effect of job displacement on the respective outcome. Regressions used matched control group and control for age, year and individual fixed effects. Dashed vertical lines show business cycle troughs. Earnings in 2000 prices.

**Source:** Own calculations.

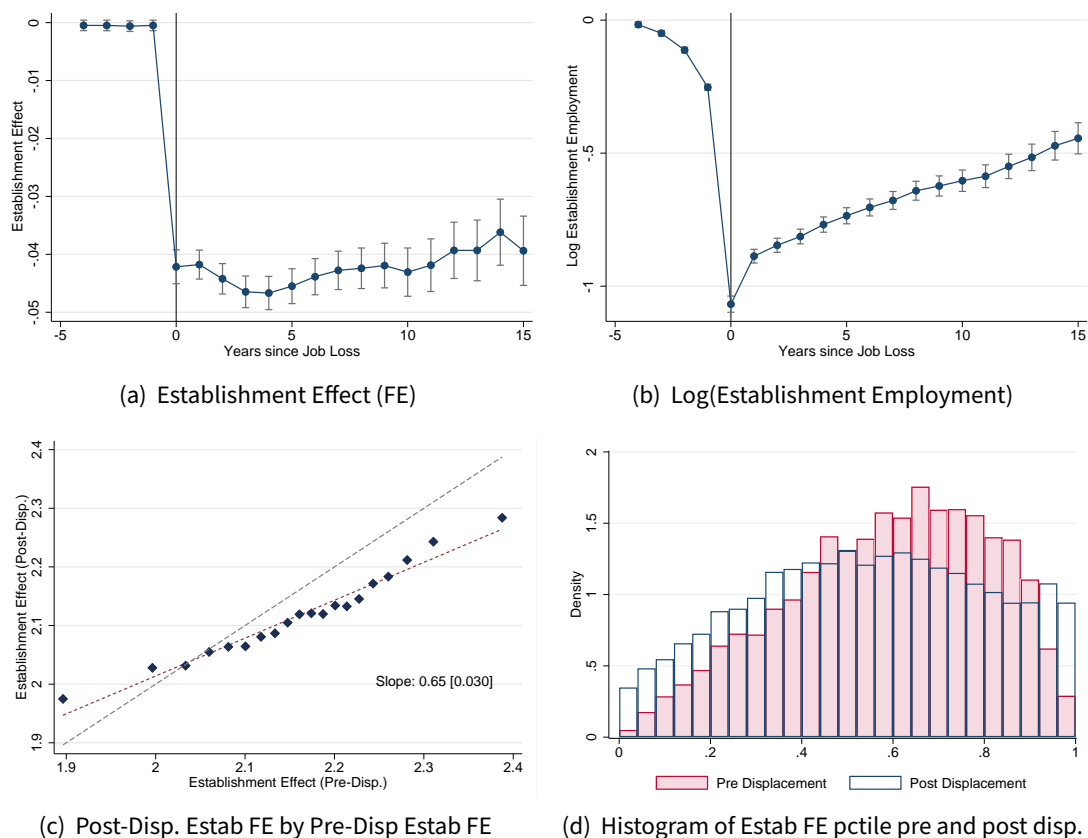
**Figure A-29: Earnings, Employment and Wage Losses by State of Labor Market - Sample: Women, West Germany**



**Notes:** The figure shows scatterplots of the earnings and wage losses of job losers collapsed to the year level, relative to the year-over-year change in the unemployment rate. Panel (a) shows the effect on earnings levels. Panel (b) shows earnings change relative to the average earnings of the control observation. Panel (c) the effect on losses in annual days worked. Panel (d) show the effect on log daily wages. The figure also shows the slope and standard error of the regression line.

**Source:** Own calculations.

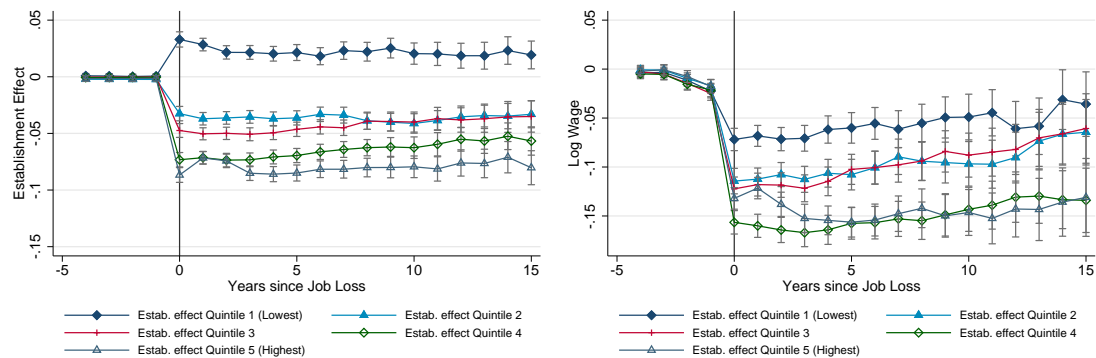
**Figure A-30: Establishment Characteristics after Job Displacement - Sample: Women, West Germany**



**Notes:** Panels (a) and (b) show the effect of jobloss on establishment effects and log establishment size from event study regressions (see Figure 1). Panel (c) shows a binned scatter plot of post-displacement establishment effects vs. pre-displacement establishment effects among the displaced workers. Estab. effects are the average of the 3 years (5 years) prior (post) displacement. Bins are vintiles of the distribution of pre-displacement establishment effects among displaced workers. Dashed gray line is 45 degree line, red line the regression line. Panel (d) shows histograms of the pre- and post-displacement distribution of establishment effects, where teh estab. effects are normalized to percentiles of the overall distribution in the AKM sample (i.e. in a random sample the distribution would be flat).

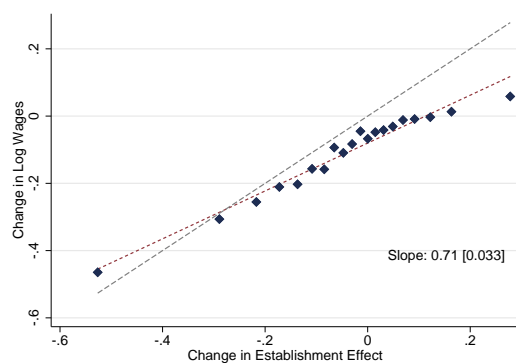
**Source:** Own calculations.

**Figure A-31: The Relationship between Losses in Establishment Fixed Effects (FE) and Wage Losses at Job Displacement - Sample: Women, West Germany**

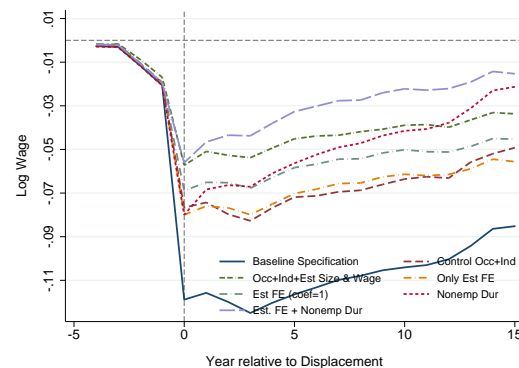


(a) Estab FE by Quintile of Displacing Estab FE - Quintiles based on Analysis Sample

(b) Log Wages by Quintile Displacing Estab FE - Quintiles based on Analysis Sample



(c) Wage Loss by Estab FE Loss

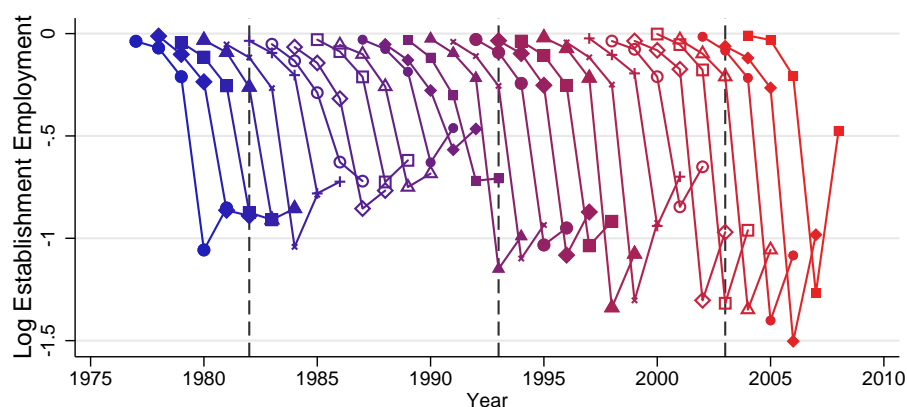


(d) Log Wage Losses Controlling for Post-Disp. Characteristics

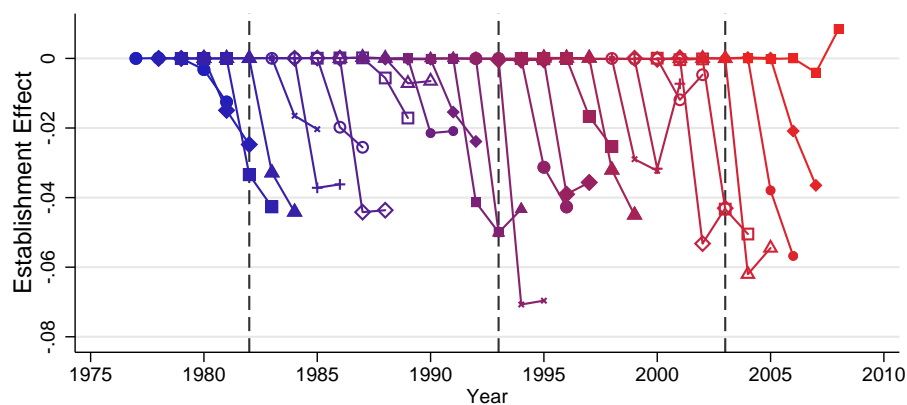
**Notes:** Panels (a) and (b) show the effect of jobloss on establishment effects and log wages from event study regressions (see Figure 1) separately by quintiles of the pre-displacement establishment effect. The quintiles are based on the distribution among displaced workers. Panel (c) shows a binned scatter plot of the diff-in-diff (based on matched pairs) in log wages vs. the diff-in-diff in establishment effects. The gray dashed line is the 45 degree line, the red line the regression line. Panel (d) shows the effect of job loss on log wages from an event study regression (see Figure 1) while consecutively adding more post-displacement controls: occupation and industry effects, establishment size and establishment average wage, establishment effects (from AKM model), establishment effects (from AKM model) with coefficient constraint to 1, and duration of the post-displacement nonemployment spell. Baseline corresponds to Figure 1 (d).

**Source:** Own calculations.

**Figure A-32: Employer Characteristics (Number of Employees and Establishment Fixed Effect) of Displaced Workers by Year of Job Loss - Sample: Women, West Germany**



(a) Log Number of Employees at Establishment

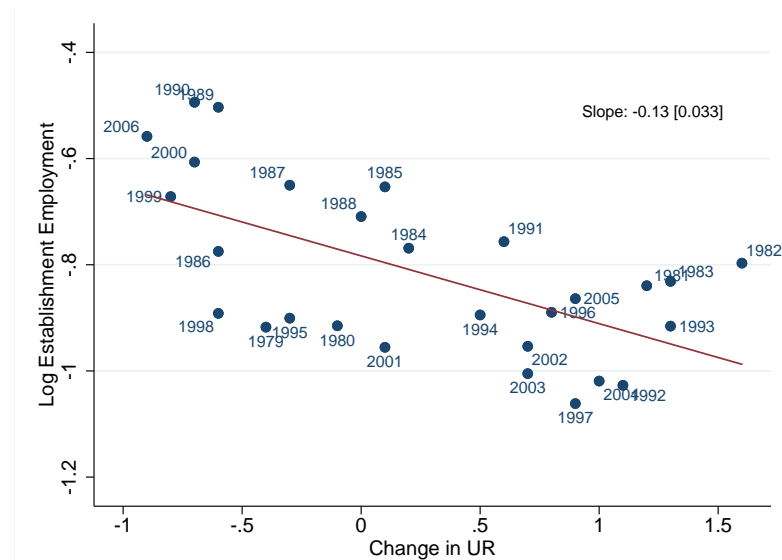


(b) Establishment Effect

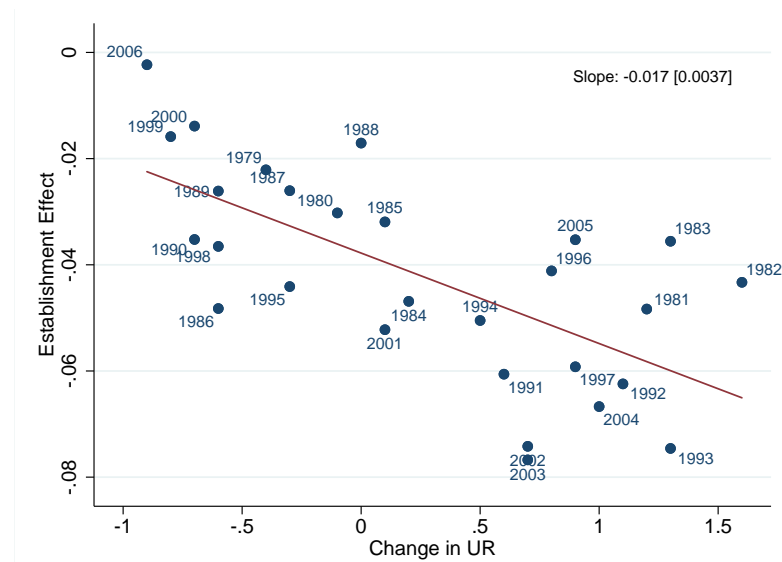
**Notes:** Each line plots the coefficients from a separate event study regression estimating the effect of job displacement on the respective outcome. Regressions use matched control group and control for age, year and individual fixed effects. Dashed vertical lines show business cycle troughs.

**Source:** Own calculations.

**Figure A-33: Effect of Job Loss on Employer Characteristics 3 Years After Displacement by Year of Job Loss vis-a-vis Change of Unemployment Rate at Job Loss - Sample: Women, West Germany**



(a) Log Number of Employees at Establishment



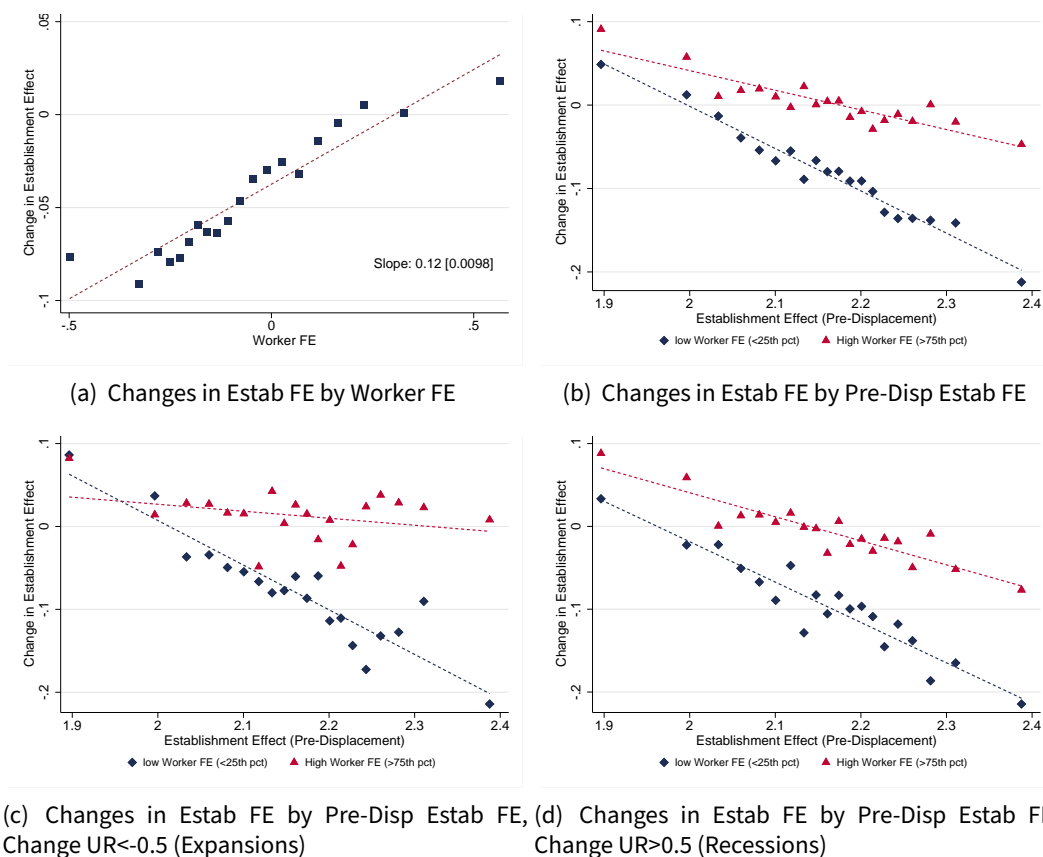
(b) Establishment FE

**Notes:** The figure shows scatterplots of the earnings and wage losses of job losers collapsed to the year level relative to the year over year change in the unemployment rate. The top figure shows the change in log establishment employment. The bottom figure shows the change in the establishment effect. The red line shows a regression line with the indicated slope (and SE).

**Source:** Own calculations.



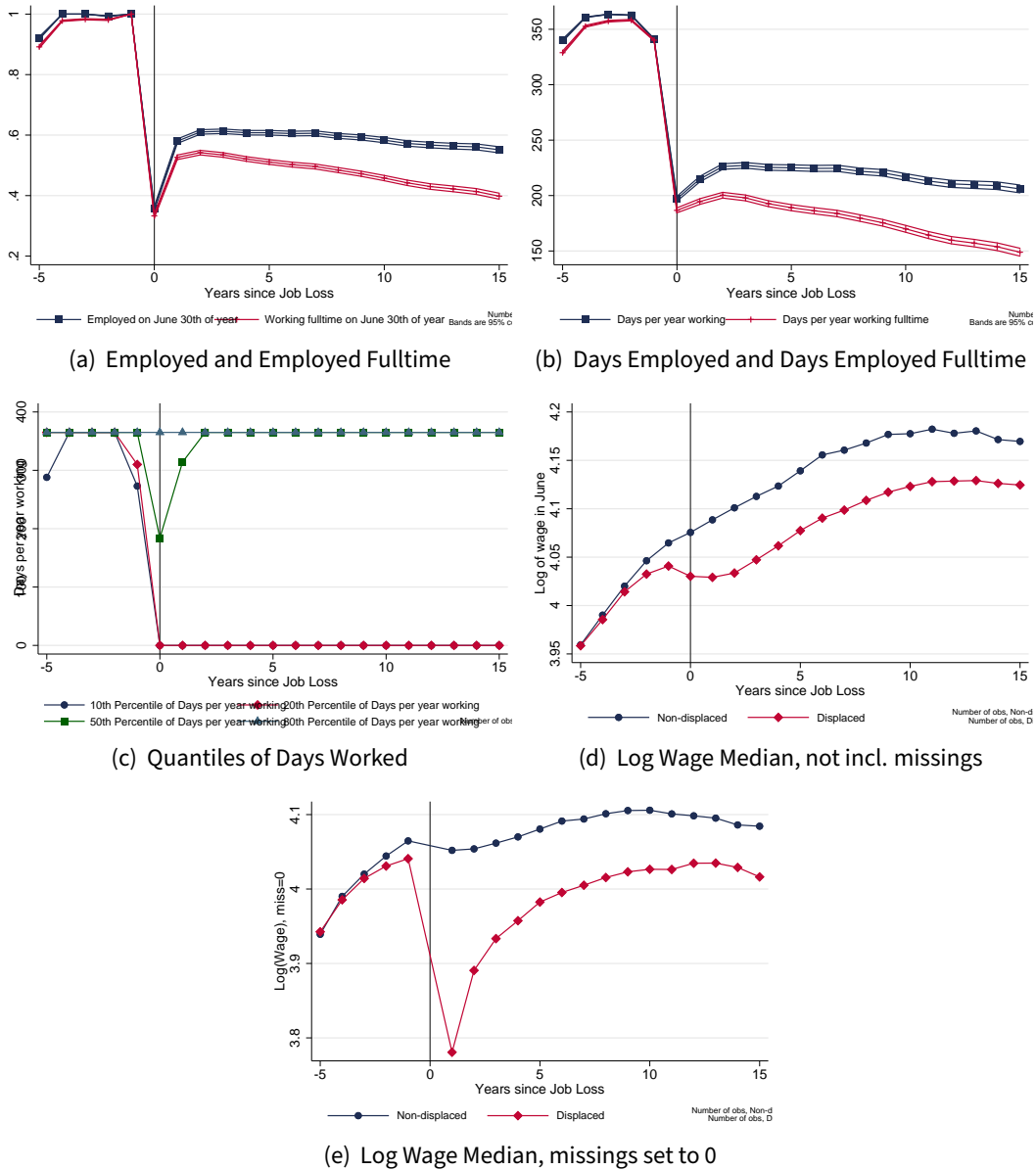
**Figure A-34: The Role of Jobloss in Reallocating Low Skill Workers to Low Estab FE Firms - Sample: Women, West Germany**



**Notes:** Panel (a) shows a binned scatter plot of the diff-in-diff (based on matched pairs) in establishment effects vs the individual effect of the displaced worker. Panel (b)-(d) show binned scatter plots of the diff-in-diff in establishment effects vs. the pre-displacement establishment effect, while splitting the sample into high (above 75th percentile) and low (below 25th percentile) workers. Panel (b) shows the overall relations, while (c) and (d) further split it by expansions vs. recessions.

**Source:** Own calculations.

**Figure A-35: The Effect of Job Displacement on Fulltime / Parttime, Days worked and Median Wages**  
- Sample: Women, West Germany



**Notes:** The figures show labor market outcomes for displaced and non-displaced workers. The red line corresponds to workers who are displaced from year -1 to 0. Each point represents the average value in the respective worker group. The figure is constructed pooling workers displaced between 1979 and 2008, while the outcome data spans 1975-2009.

**Source:** Own calculations.